

The Mining Journal

AND ATMOSPHERIC RAILWAY GAZETTE,

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 547.—VOL. XVI.]

LONDON: SATURDAY, FEBRUARY 14, 1846.

[PRICE 6D.]

KNOWBURY IRON-WORKS, five miles from LUDLOW, in the county of Salop.—Valuable MACHINERY, SEVEN excellent STEAM-ENGINES, several hundred yards of WROUGHT-IRON EDGE and TRAM RAILS, Sound and Flat Chain, Weighing Machine, and other effects, of James Geo. Lewis, Esq., TO BE SOLD, BY AUCTION, by Mr. WILLIAM HALL.

On the above premises, on Thursday, the 19th day of February, 1846, without reserve:—
WINDING ENGINE, with 36-inch cylinder, 3-foot stroke winding apparatus and drum, 440 yards of 3-link flat chain, 2 1/2 foot pulleys, and frame 4 feet diameter.
PUMPING ENGINE, 25-inch cylinder, 3-foot 4-inch stroke winding apparatus attached, with double cranks and T-bobs, about 230 yards of flat chain, 35 yards of 6-inch pump to each lift, and about 170 yards of wrought-iron pump rods to each ditto.

A **DOUBLE ENGINE** with 2 boilers, 24-inch cylinder, 6-foot stroke driving and fly wheels and shafts, with a merchant iron rolling mill and all its rollers, scales and cutters, roll and boring lathe, furnaces, lathe and shears.

WINDING ENGINE, 26-inch cylinder, 3-foot stroke winding apparatus and drum, 440 yards of 3-link flat chain, pit head pulley and frame, &c.
MINE ENGINE, 48-inch steam cylinder atmospheric, working a stroke of 6 feet, with two sets of pumps of about 30 yards each, 10 1/2 and 10 1/4 inches in diameter, rods, gin, capstan, and ropes.

HIGH PRESSURE WINDING ENGINE, 11 1/2-inch steam cylinder, 2-foot 9-inch stroke winding apparatus, 148 yards of 3-link flat chain, pit head frame and pulley, 4-foot diameter (nearly new).

ATMOSPHERIC WINDING ENGINE, 24-inch cylinder, 4-foot stroke winding apparatus, about 150 yards of 3-link flat chain, pit frame and pulley, 4 feet diameter, 1-horse gin pit frame and rope, a superior weighing machine, upwards of 1000 yards of wrought-iron edge and tram rails, cast-iron saddles, quantity of round and flat chain, 2 beds for carriages, coal and pit wagons, wryne complete, wheelbarrows, scales and weights, &c. &c. Sale to commence at Eleven o'clock punctually.

Catalogues to be had at the auctioneer's office, High-street, Shrewbury; Crown Inn, Ludlow; Stork Hotel, Wolverhampton; and the principal inns in the neighbourhood.

NEWTOWARDS LEAD MINE.—TO BE SOLD, BY PUBLIC AUCTION, at the Old Fellows' Hall, Douglas, Isle of Man, on Thursday, the 12th day of March next, at Twelve o'clock at noon, in lots, ONE HUNDRED and NINETY-ONE SHARES of the NEWTOWARDS LEAD MINE, in the county of Down, Ireland. This mine embraces the whole of the town lands of Whitespots; it is lately been extensively opened, and furnished with sufficient machinery to extend the workings for many years; is now in a remunerative state, with every prospect of immediate further improvement, and consists of 598 shares, held under lease from the Marquis of Londonderry, for an unexpired term of 18 years, from the 1st November last, and a life, now six years of age, yielding a royalty of 1-10th. The youth having a strong constitution, and the families noted for longevity, causes the property to be valuable, and worthy the notice of mining adventurers.

LEAD MINES AT STRONTIAN, ARGYLSHIRE.—TO BE LET, for such a number of years as may be agreed upon, the well-known and valuable LEAD MINES in the neighbourhood of STRONTIAN. A level, or adit, which has been in progress for many years, has lately been driven into a mine of great extent, and rich in ore, by which the water has been cleared out, and a convenient access given to the works. These mines are in the vicinity of Lochsnan. The neighbourhood is inhabited by a thriving and industrious population, of good moral character, among whom are many skilful miners. There is a smelting furnace and a crushing-mill near the entrance to the level, and an abundant supply of water. With these advantages, the work may be begun without delay. As few mines possess a more extensive field for successful speculation, they are well worthy the consideration of capitalists, who are hereby invited to visit them.—Offers will be received by Sir James Miles Riddell, Bart., or by William Kennedy, Esq., factor, Stroxtian.

ETNA IRON-WORKS, Darlaston-Green, Staffordshire, FOR SALE, BY PRIVATE CONTRACT, consisting of a 24-inch HIGH-PRESSURE STEAM-ENGINE, with three boilers, driving a forge and pair of 16-inch forge rolls, and an 8-inch mill, adapted for finishing merchant bar-ropes, wire-ropes, and guide rods; THREE PUDDLING, and ONE MILL, FURNACES, and other necessary conveniences. Also the excellent MINE of COAL (recently sunk through on the premises), THINSTONE, and OTHER MINES, under and adjoining the same.

Address, or apply, to Mr. GILL, on the premises.

HELEN IRON-WORKS, near BERWICK-UPON-TWEED.—This highly desirable IRON FOUNDRY, &c., with its valuable MACHINERY, IMPLEMENTS, BOXES, and PATTERNS, TO BE SOLD, BY PRIVATE BARGAIN. Applications for plans and catalogues to be made to Robert Guthrie, 129, Fenchurch-street, who will treat for his sale.

TO COPPER SMELTERS, AND OTHERS CONNECTED WITH THE COPPER AND BRASS BUSINESS.—TO BE SOLD, BY PRIVATE CONTRACT, THE OLD ESTABLISHED and EXTENSIVE WORKS, known as the WHISTON COPPER WORKS, situated at Whiston, near Cheshire, in the county of Stafford, now in the occupation of the proprietors. The works now contain two copper smelting furnaces, a calciner, and a copper refinery furnace, and three furnaces and two calciners, for spelter. There is ample room to extend the works and increase the business to any amount—the site and adjoining land, which will be sold with the works, comprises about 15 acres. A blacksmith's shop, cottage, and office, are attached to the works. The purchaser may have the option of taking the stock in trade, at a valuation. Whiston is one mile from the Cheshire Canal, and from the proposed line of the North Staffordshire Railway, now before Parliament, in the immediate neighbourhood of cheap coal, and about 10 miles from the celebrated Eton Mines, and other copper mines in the same neighbourhood. Within one mile of Whiston is a bed of stone, which has been proved to answer well for the manufacture of glass; and either the present works may be easily converted into a glass manufactory, or one might be built on part of the vacant land.—The premises may be viewed at any time; and for further particulars, or to treat for the purchase, application may be made to Messrs. Wm. Sneyd and Co., at the works, or to Mr. John Nixon, Bedford, near Leek.—Feb. 2, 1846.

FIR TREES.—TO BE SOLD, A LARGE QUANTITY OF SCOTCH FIR TREES, FIT FOR MINING PURPOSES, varying from 2, 3, and 5 feet of timber in each tree, and from 10 to 15 feet long.—Price from 1s. 6d. to 3s. 6d. per tree, to be delivered in Sutton Pool, Plymouth Harbour, or by vessel.—For further particulars, application to be made to Mr. Craze, Plymouth St. Mary, Devon. Also a large collection of STONES, &c.—The whole for cash payments.

TO BE SOLD, TWO excellent BOILERS, 15 feet long by 8 feet diameter, with flue through the middle—made of the best Staffordshire plate-iron, and nearly new. Can be delivered immediately, either by rail, canal, or sea, to any port of the United Kingdom.—Apply, by letter, to the Meadowbank Salt Works, Worsley, Cheshire.

FOR SALE, AT WHEAL PROSPER, near MARAZION.—FOR SALE, ONE or TWO HUNDRED TONS of superior MUNDIC (iron pyrites).—Any one likely to buy, may have samples forwarded, and further particulars may be known by applying to Captain Thomas Richards, Marazion.—Dated Feb. 4.

MINING MATERIALS FOR SALE.—The VALUABLE MINING MATERIALS at WHEAL COFFES, seven miles from Plymouth, WILL SHORTLY BE OFFERED FOR PUBLIC SALE, consisting of TWO 40-foot WATER-WHEELS, LIFTS of PUMPS, complete, from 10 to 17 inches; and a variety of useful MINING MATERIALS, particulars of which will be advertised next week. Plymouth, Feb. 12, 1846.

WANTED, by a PERSON, of twenty years' experience, a SITUATION, as MANAGER in a COLLIERY. Security can be given, if required.—Apply by letter only, 737, Midland Counties Herald Office, Birmingham.

MINING PROPERTY.—CAPITALISTS who are disposed to INVEST in CORNISH and FOREIGN MINES, will find the present opportunity very favourable for so doing. From large sums having been lately diverted from such investments for railway operations, standard mines are now selling at prices that will pay the purchaser 20 per cent. per annum for his outlay. There are also other mines that are on the eve of paying dividends, which can be recommended with confidence. Applications to be made to Mr. JAMES HERRON, mining agent, No. 3, Adam's-court, Broad-street, London.

NOTICE TO THE PROPRIETORS AND SHARE-HOLDERS OF MINES, SMELTING-WORKS, &c.

Messrs. MITCHELL and FIELD beg to inform the PUBLIC, that they have REMOVED from No. 5 to No. 23, HAWLEY-ROAD, KENTISH TOWN, where they have created a spacious LABORATORY, fitted expressly for the performance of all OPERATIONS CONNECTED WITH MINING.—Practical instruction to gentlemen in Assaying Mineral Analysis, and Manufacturing Chemistry in general.

All communications to be addressed to Messrs. Mitchell and Field, assayers, No. 23, Hawley-road, Kentish Town.

THE PATENT SAFETY FUSE.—FOR BLASTING ROCKS IN MINES, QUARRIES, AND FOR SUBMARINE OPERATIONS.—This article affords the SAFEST, CHEAPEST, and most EXPEDIENT MODE of effecting this very hazardous operation. From many testimonies to its usefulness with which the manufacturers have been favoured from every part of the kingdom, they select the following letters, recently received from John Taylor, Esq., F.R.S., &c. "I am very glad to hear that my recommendations have been of any service to you; they have been given from a thorough conviction of the great usefulness of the safety fuse; and I am quite willing that you should employ any means to give effect to this." Manufactured and sold by the PATENTERS, RICKFORD, SMITH, and DAVEY, Cornhill, London.

SOCIETY OF ARTS.—The FIFTH ORDINARY MEETING of the Society of Arts will be HELD in the Great Room, at the Society's House, John-street, Adelphi, on Wednesday, February 13, 1846.—The following, among other communications, will be made:—

On Railway Locomotion, with reference to the effects of Centrifugal and Centripetal Forces acting on Bodies in very rapid Motion. By Mr. C. H. Gassnerow.

On a New Locomotive Steam-Engine; the objects being to prevent rocking and vibratory motion, and to obtain the advantage of large driving wheels, without increasing the height of the centre of gravity. By Mr. T. H. Crampton.

On Mr. Parsey's Compressed Air Locomotive. By W. E. Newton, Esq.

STEAM TO INDIA VIA EGYPT, MALTA, ITALY, ALEXANDRIA, AND THE PENINSULAR PORTS.

PASSAGE TO BOMBAY, MADRAS, AND CALCUTTA. The Peninsular and Oriental Steam Navigation Company BOOK PASSENGERS for CEYLON, MADRAS, AND CALCUTTA direct, by steamers leaving Southampton on the 20th, and for Alexandria, en route to Bombay, on the 1st of every month.

A steamer from Southampton leaves the 1st and 20th of every month for Malta, whence are steamers to Naples, Genoa, Civeta Vecchia, three times a month.

STEAM TO CORUNNA, OPORTO, VIGO, LISBON, CADIZ, AND GIBRALTAR. A steamer leaves Southampton on the 7th, 17th, and 27th of every month.

Apply at the Peninsular and Oriental Steam Navigation Company's offices, 51, St. Mary Axe, London, where only passages can be secured throughout.

Just published, Part I., **COMBUSTION OF COAL, CHEMICALLY & PRACTICALLY CONSIDERED.** With coloured plates. By CHARLES WYKE WILLIAMS, Esq. London: Simpkin, Marshall, & Co., and J. Weale—Birmingham: Wrightson & Webb.

Published this day, price 4s., **DR. WALL'S IMPROVEMENTS IN THE MANUFACTURE OF IRON, COPPER, STEEL, AND OTHER METALS, BY THE APPLICATION OF VOLTAIC ELECTRICITY.** London: E. Palmer and Son, 18, Paternoster-row, and all booksellers.

THE PATENT GALVANISED IRON COMPANY call PUBLIC ATTENTION to the following, amongst other GREAT WORKS executed with their patent article:—

THE ROOFS OF THE NEW HOUSES OF PARLIAMENT, at Westminster. THE SLIPS, or SHEDS, for building "flat-roofs," in the ROYAL DOCKYARDS, at Woolwich, Portsmouth, Deptford, &c. (the latter visible in passing down the Thames, and is an object of great beauty, having a centre span of eighty-two feet). The Timber Sheds, and other buildings, in the Royal Dockyards, are also being roofed and constructed with this fire-proof material.

THE BUOYS and other MARINE WORKS of the Honourable Corporation of the Trinity House have for two years been constructed with the Galvanised Iron, which resists effectually the action of sea water.

The celebrated ELECTRIC TELEGRAPHS of Messrs. Cooke and Wheatstone are CONSTRUCTED exclusively with the company's Galvanised Wires, &c.

And this indestructible iron, under all common influences—viz., sea water, saline or damp atmospheres, is admirably adapted for ROOFING in all climates, being Fire, Hurricane, and Lightning proof, if a continuous communication be formed with the earth by Galvanised Iron Spouting attached to the roof. DOCK-WORK, chain or wire rope bridges, fire fences, fire proof buildings, corrugated doors, shutters, greenhouses, conservatories, and an endless variety of purposes.

Roofs of gas works and chemical manufactories. Ship-building purposes—viz., blocks, bolts in lieu of copper, and knees.

For chain rigging, wire rigging, and sheathing, it is extensively used, and the following CERTIFICATE, amongst many others, is annexed:—

Lloyd's Register, London, February 7, 1846.

The undersigned surveyors to this society, at the request of Messrs. Malins and Rawlinsons, examine the Patent Galvanised Iron Sheathing upon the bottom of the brig Mary Stewart, lying in Messrs. Curlling, Young, and Co.'s dry dock, Limehouse, and lately returned from a voyage to the Island of Looe, on the coast of Africa, and found it unbroken and perfect throughout the vessel's bottom, and no appearance of corrosion or oxide of iron upon its surface. The iron that had been exposed by puncturing the nail holes had become coated with zinc—the sheathing was nearly clean, and free from marine growth and animalcules. It appears to have answered very well during the before-mentioned voyage, and the ship has sailed without it being found necessary to do any repairs to it.

PETER COURTENAY, L. H. RITCHIE, JAMES MARTIN, Lloyd's Surveyors.

The company are prepared to supply all articles required, or execute work of every description.

Wrought London, at Millwall, Poplar, near West India Docks; Staffordshire, Phoenix and Lea Brook Iron-Works—from which corrugated iron and every description of iron, galvanised or otherwise, can be supplied; also, from the South Wales Works, near Bridgend, Glamorganshire.

Office—3, Mansion-house-place, London.

CAUTION AND NOTICE.

This GREAT PATENT, like every good one, is invaded, and, by the law's delays (and its miserable state as regards the interests of patentees), the parties are able to evade the consequences some short time longer. The same thing has occurred with other patents. In Nelson's Hot-Blast Patent the invasion went on for years; but one firm only had the last to pay upwards of £120,000 for the same. Messrs. Malins and Rawlinsons, as well as SELLERS as well as BUYERS, are LIABLE, and the PATENTERS will PROCEED AGAINST ALL PARTIES who INVADE this one of the most IMPORTANT INVENTIONS ever brought into use.

Actions are proceeding against Messrs. Morewood and Rogers, Messrs. Walker (Gospel Oak), and many others.

The company take this opportunity of giving the most unequivocal contradiction to the advertisement issued by Messrs. Morewood and Rogers on 8th August.

PATENT GALVANISED TINNED IRON.

MOREWOOD AND ROGERS' PATENT.

The PATENTERS beg to call the attention of the PUBLIC to the ABOVE METAL, which is being USED extensively by the LORDS COMMISSIONERS of the ADMIRALTY, the BOARD OF ORDNANCE, and OTHER PUBLIC BODIES.

FOR ROOFING AND OTHER PURPOSES.

The large WAREHOUSES and SHEDS in the LIVERPOOL DOCKS have had the ZINC with which they were formerly covered STRIPPED OFF, for the purpose of being COVERED WITH IT; and the NEW DOCK WAREHOUSES of that city are likewise being COVERED WITH THIS METAL.

It is peculiarly ADAPTED FOR RAILWAY STATIONS, as forming a light, strong, and indestructible covering.

THE PROCESS is the ONLY ONE by which the QUALITY of the IRON is PRESERVED, instead of being injured; and it is, therefore, so very malleable, that it may be worked up with the greatest ease into articles of all descriptions.

Further information may be obtained on application at the WAREHOUSE No. 9, STEEL-YARD UPPER THAMES-STREET.

THE PATENT GALVANISED IRON COMPANY.

CAUTION.—The public are cautioned against giving credit to the mis-statements put forth by the Galvanised Iron Company in their advertisement.

THE ONLY ACT OF INFRINGEMENT in regard to this Patent is one, NOT AGAINST MOREWOOD AND ROGERS, OR ANY OTHER PARTY CONNECTED WITH THEM, BUT A WRIT OF SCIRE FACIAS AGAINST THE COMPANY'S PATENT FOR ITS CANCELLATION.

Nothing can be more unfortunate than the comparison between this Patent and that of Nelson's, which was held by the jury to be valid, whereas THAT OF THE GALVANISED IRON COMPANY WAS, AFTER THREE DAYS' TRIAL, FOUND, UPON THEIR OWN EVIDENCE, TO BE INVALID.

They assert that their Patent is being invaded—this we entirely deny; and to show the folly of the charge, the working of it was found by the jury to be impracticable. No one—not even they themselves—ever have, or ever will be able to work it.

In working as they now do, they have ADOPTED PART OF OUR PROCESS, specified in our patent, WITHOUT OUR LEAVE OR LICENSE.

With regard to delay, it has been entirely on their part, as the records of the courts will prove. They have availed themselves of every opportunity to hinder and delay the *scire facias*, now proceeding, by applications for time, &c.; and, finally, by putting in a plea, which their solicitor swore, he believed, to be necessary for the defence of their patent from cancellation, but which the Lord Chancellor, on Monday last, refused to admit, and dismissed their appeal with costs.

MOREWOOD AND ROGERS.

Patentees of Galvanised Tinned Iron.

Warehouse, 9, Steel-yard, Upper Thames-street.

August 23, 1845.

PATENT GALVANISED IRON COMPANY.—NOTICE.

—This patent was decided by the jury, in Patterson v. Holland, tried in the Common Pleas in February last, to be invalid, and their verdict has not been set aside. The delay in actually cancelling the patent by the *scire facias* issued for that purpose, is solely ascribable to the patentees resorting to frivolous and dilatory measures for postponing proceedings—thus showing that they well know how each proceedings must terminate.

RAILWAY GREASE.—RAILROAD CONTRACTORS,

MINING AGENTS, and OTHERS, who require a FINE CHEAP GREASE for HEAVY BEARINGS, are requested to TRY JOSEPH TURNBULL'S ANTI-FRICTION GREASE, which is proved by scientific men to surpass all others for its lubricating qualities, and for cheapness.—Samples and price, per return of post, by applying to F. Taylor, No. 45, Munster-square, Regent's-park, GOLA AGENT FOR LONDON; or H. Bland, Bedford, and Co., Bedford.

Single and double keels, to raise from two to twenty tons, at wholesale prices.

RYE AND THOMAS, MINE AGENTS AND DEALERS IN STOCKS, RAILWAY AND OTHER SHARES, 80, OLD BROAD-STREET, LONDON, AND AT LISKEARD, CORNWALL.

JAMES LANE, SHARE AGENT HALL OF COMMERCE, LONDON.

WILLIAM TRENER, DEALER IN RAILWAY AND MINING SHARES—ESTABLISHED TEN YEARS. OFFICES, No. 30, THREEDNEEDLE-STREET, LONDON.

WILLIAM FOX AND SON, No. 53, CASTLE-STREET, LIVERPOOL, have always on SALE PIG-IRON, RAILWAY BARS, CHAINS, and IRON of every description.—TIN PLATES, WIRE, &c.

MESSRS. LAMOND, SMALE, and LAMOND'S PUBLIC SALE OF RAILWAY SHARES, &c., are HELD, at the Hall of Commerce, Threedom-street, every TUESDAY and FRIDAY, at One o'clock precisely.—Orders received until Four o'clock of the day prior to sale.—London, Feb. 13, 1846.

UNITED MEXICAN MINING ASSOCIATION.—Notice is hereby given, that a DIVIDEND of FIVE SHILLINGS per share will be PAYABLE at the office of the association on and after Wednesday, the 11th of February next, between the hours of Eleven and Three. Forms for claiming the dividend may be obtained at the company's office, and must be left two clear days, for examination, previous to payment. By order of a court of directors, JOHN MATHER, Secy.

The holders of scrip shares will not be entitled to receive the dividend until that shares are registered.

IRISH WASTE LAND IMPROVEMENT SOCIETY, 3, ST. MILDRED'S COURT, POULTRY, LONDON.

Notice is hereby given, that the next HALF-YEARLY GENERAL MEETING of proprietors of this society will be HELD at the King's Head Tavern, in the Poultry, London, on Thursday, the 26th of February next, at One o'clock precisely; and Notice is hereby also given, that Edward Joshua Cooper, Esq., having retired from the direction, a vacancy is thereby occasioned, which, in conformity with the Act of Incorporation, must be supplied at the said meeting. By order of the court of directors, FREDERICK FRY, Secretary.

February 5, 1846.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

SMART'S ELLIPTICAL CONVEX METALLIC PADDLE FLOATS, FOR PROPELLING STEAM-SHIPS.—The very great superiority of this invention over the common float, in all points, having been fully proved by its use on various steamers of from 90 to upwards of 300-horse power—and applications being made for licensing several iron steamers, from 70 to 300-horse power, the patentee cordially recommends it to the Government and the public generally.

Its superiority consists, in beauty of appearance, stability, durability, its property of greatly reducing vibration and undulation, its inexpensiveness, powerful agency in checking a ship in chance of collision—and what is of the greatest consequence, giving an immense increase of speed. All these must have a powerful influence, not only on steam proprietors, but more especially on the minds of the steam-travelling public. These floats can be easily applied to any wheel.

Applications for license (for which a fee of 10s. per horse-power is charged) to be made to the patentee, Mr. Robert Smart, 5, Grenville-place, Hotwells, Bristol, or his agents.

TO RAILWAY CONTRACTORS, COLLIERY OWNERS, ENGINEERS, AND OTHERS.—THE PATENT VEGETABLE GREASE, at REDUCED PRICE, 12s. per cwt. for each—the quality the same as that formerly sold at 30s. per cwt.—JAMES THOMAS FITT respectfully thanks those friends who have patronised him during the last ten years, and trusts, by strict attention to the quality of the article, and promptness in completing orders, to merit the continuance of their favours.—THE PATENT VEGETABLE GREASE, for ANTI-FRICTION PURPOSES, at REDUCED PRICE.—Orders, stating by what conveyance, addressed to J. T. FITT, 52, Mead, Brompton, New-road, London.

TO ENGINEERS, RAILWAY CONTRACTORS, MINING AGENTS, IRONMASTERS, AND OTHERS REQUIRING FINE GREASE FOR MACHINERY AND AXLES of every description.—JOSEPH PERCIVAL'S IMPROVED ANTI-FRICTION GREASE is—after trials on machinery and axles of every kind where constant friction is kept up—submitted to be the most useful, economical, and best preparation of the kind ever offered to the public.

References to scientific and practical men can be given, and testimonials shown to its great excellence.—Samples forwarded on application at the manufactory, Green-street, Wellington-street, Blackfriars-road, London.

PAYNE'S PATENT PROCESS FOR THE PRESERVATION

AND IMPROVEMENT OF TIMBER, &c.—PAYNE and LODGE beg to invite the attention of Engineers, Railway Companies, Architects, and others, to the ABOVE PROCESS, and to state that they are prepared to ERECT the necessary APPARATUS in any part of the United Kingdom, where the quantity is sufficiently large to cover the outlay of its removal.—Further particulars can be obtained at WHITEHALL WHARF, CANNON-Road, WESTMINSTER, or at their other stations—FLEETWOOD-ON-WYRE, LANCASHIRE, UNION WHARF, SOUTHAMPTON, and WISBEACH, CAMBRIDGESHIRE, GUILDFORD, SURREY.

SEYSSSEL ASPHALTE COMPANY.—CLARIDGE'S

PATENT.—ESTABLISHED MARCH, 1838.

FOR WORKING THE MINERAL ASPHALTE ROCK OF PYRMONT SEYSSSEL, A Bituminous Rock, situated on the Eastern side of the Jura.

PRINCIPAL DEPOTS:

ROUEN, MARSEILLES, AND STANGATE, Surrey Side of Westminster-bridge, London.

The ASPHALTE of SEYSSSEL has been EXTENSIVELY USED, since March, 1838, for the following useful purposes:—

FOOT PAVEMENTS (public and other) MALT-HOUSE FLOORS

KITCHEN FLOORS BASEMENTS—where it is essential to keep FIGGERIES, &c.

COVERING OF RAILROAD AND OTHER ARCHES

The only effectual mode to prevent the percolation of water, which also renders it very appropriate for the LINING OF TANKS, FISH-PONDS, DRAINS, &c. &c.

Note.—The Seyssel Asphalt Company are prepared to enter into special contracts for the execution of railway work, and other public works of magnitude.

J. FARRELL, Secretary, Seyssel Asphalt Company, Stangate, London.

PILBROW'S ATMOSPHERIC RAILWAY AND CANAL

PROFUSION COMPANY.—Completely Registered.

DIRECTORS.

The Right Hon. the Earl of ESSEX, Chairman. The Right Hon. the Earl of Bessborough. Lieutenant-Colonel Gifford. G. B. Bolton, Esq. F. J. Lambert, Esq.

Dr. J. G. Hewlett, Resident Director.

Directors of Railway and Canal Companies are informed that this company is now READY TO GRANT LICENSES FOR, or SUPERINTEND THE LAYING DOWN OF LINES ON PILBROW'S ATMOSPHERIC PRINCIPLE.

The advantages offered by their method of propulsion are, cheapness, increased speed, and safety, over every other existing system, whether locomotive or atmospheric. Leakage is entirely avoided, the tube being buried. Also an immense saving, as well in the construction as in the working of lines, not requiring tunnelling, levelling, or embankment. The surface requires but little more preparation than for the common roads.

The application of this method of propulsion to Canal Navigation will be attended with incalculable advantages.

Its superiority, efficiency, and simplicity, will be demonstrated, and explanations given, at the offices of the company, 6, King William-street, London-bridge.

CHARLES COLLINS, Secretary.

PATENT IMPROVEMENTS IN CHRONOMETERS.

WATCHES, AND CLOCKS.—E. J. DENT, 43, Strand, and 33, Cockspur-street, watch and clock maker, BY APPOINTMENT, to the Queen and his Royal Highness Prince Albert, begs to acquaint the public, that the manufacture of his chronometers, watches, and clocks, is secured by three separate patents, respectively granted in 1836, 1840, 1842. Silver-plate watches, jewelled in four boxes, 6s. each; in gold cases, from 4s. to £10 each. Gold horizontal watches, with gold case, from 6s. to 12s. each.

DENT'S PATENT DIPLIODESCOPE, or meridian instrument, is now ready for delivery. Pamphlets containing a description and directions for its use 1s. each, but to be sent on request.

OFFICE FOR PATENTS, 7, STAPLE INN, HOLBORN

J. MURDOCH (inventor and late assistant to Mr. Hebert) informs INVENTORS and PATENTERS, that at his OFFICE they can obtain

REFERENCE TO A CLASSIFIED LIST OF PATENTS

(THE ONLY ONE EXISTING), which shows at one view all the Patents ever granted for any particular object, whereby they may save much trouble and expense, and procure in return not otherwise obtainable. BRITISH and FOREIGN PATENTS OBTAINED

USEFUL and ORNAMENTAL DESIGNS REGISTERED. SPECIFICATIONS of PATENTS, and ARTICLES of ASSIGNED PATENTS, THINGS granted on moderate terms.

FINISHED and WORKING DRAWINGS executed with accuracy and dispatch.

Mining Correspondence.

ENGLISH MINES.

BARRISTOWN.—*Curry Tugman, Feb. 6.*—Since my last report, we have had our monthly setting for February, of which the following is a list:—Flat-rod shaft (nine men), cutting lodge at 18 fm. level, 20l. contract; 18 fm. level end west (six men) driving at 2l. per fm. and 4l. per ton for ore; ditto east (four men), driving 2l. per fm. and 3l. per ton for ore; engine-shaft (six men), cutting lodge at 24 fm. level, 15l. contract; footway shaft sinking (six men), 3l. 15s. per fm.; middle lode, eastern end (six men), driving 2l. 10s. per fm. and 4l. per ton for ore; stopes behind this end, working on tribute (six men), 5l. per ton for ore; Nangilas shaft sinking (nine men), 7l. 10s. per fm.; end east of this shaft (two men), 30s. per fm. for driving, and 5l. per ton for ore; ditto west driving (four men), 2l. 10s. per fm. and 4l. per ton for ore. Our tributers number at present 22 men, prices from 4l. 10s. to 5l. per fm. There is no visible change in our different places of operations, except in the 18 fm. level end, which is certainly improved. Our quantity of ore this month will very much exceed any former month's raisings.

BEDFORD UNITED.—*Feb. 10.*—At Wheel Marquis, in the 80 fm. level south, a branch about 1 ft. wide has been met with, on which we purpose driving, to ascertain if it is the main lode, as it is probable, from its vicinity to the cross-course, the lode may be disordered. The lode in the 70 fm. level east is 18 ft. wide, and worth 28l. per fm.; and in the stopes, in the back of this level, the lode is worth 10l. per fm. In the 58 fm. level east the lode is 23 ft. wide, and worth 8l. per fm. The lode in the 47 fm. level west, on the south lode, is 12 ft. wide, and worth 4l. 4s. per fm. At Ding Dong, in the 24 fm. level west, the lode is 8 ft. wide, composed of spar and tin, of the latter producing some good saving work, and altogether more kindly. At Wheel Tavistock, the lode in Phillips's engine-shaft is 2 ft. wide, composed of muncie, prun, and ore. In the 30 fm. level east the lode is 15 in. wide; and west, about 20 in. wide, composed of muncie, spar, and ore, kindly. We weighed at Morwellham, on Friday, the 30th ult., November ores, 103 tons 6 cwt.; and sampled December ores, computed 104 tons 21 cwt. —**JAMES PHILLIPS.**

BREWER.—At the account, held on the 2d inst., the labour cost for Nov. and Dec. was shown as 239l. 18s.; merchants' bills, 139l. 1s. 9d.—372l. 19s. 9d. By copper ore sold Dec. 11 (less dues, 45l. 13s. 11d.), 639l. 15s. 6d., which, with balance of last account (298l. 2s.), leaves a profit of 564l. 17s. 9d. A dividend of 3l. per share (360l.) was declared, and 204l. 17s. 9d. balance is now in pursuer's hands.

CALLINGTON.—*Feb. 9.*—In the north mine engine-shaft the ground is more favourable for sinking below the 90 fm. level; at this level, driving north, the lode is yielding good work, leaving ground that will set at 4s. in the pound, on the value of the lead; in the south end, the lode is not so good; the back will set at 7s. in the pound. In the 80 fm. level we are driving through ground that will set at 10s. in the pound, on the value of the lead. In the 70 fm. level the lode has not been taken down; the pitches in the back and bottom of this level, on the copper lode, are looking promising; the men making wages. We have recommended sinking Johnson's engine shaft below the 112 fm. level. In the 100 fm. level, driving south, the ground is more favourable for driving; the lode presenting a kindly appearance, not taken down; we hope to communicate the rise in the back of this level this week. In the 90 fm. level the lode continues just the same as reported last week. —**J. T. PHILLIPS.**

CHYPRAZE.—At the account, held on the 29th ult., it appeared that the labour cost from 1st July to 31st December was 1152l. 4s.; merchants' bills, 208l. 11s. 2d.—1360l. 15s. 2d. By tin sold (less dues), 2508l. 0s. 8d.; from which deduct balance due pursuer last account (259l. 2s.), left an available profit of 893l. 3s. 6d. A dividend of 7l. 10s. per share (885l.) was declared, and there is 8l. 3s. 6d. now in pursuer's hands. The prospects of the mine are stated to be very flattering; there is now about 20 tons of tin at grass; and it is fully expected that the present rate of dividend will be fully maintained.

DEVON AND COURNEY CONSOLS.—I beg to inform you that in the deep adit level, driving east, the ground is very much improved for driving, being in a beautiful strata of light blue kilaas, and we are giving for driving 2l. 5s. per fm. The lode in the end is about 3 ft. wide, composed of muncie, peach, flookan, lead, and spots of copper ore, and may be considered a very promising lode at present. —**SAMUEL SPRAGUE.**

EAST TAMAR CONSOLS.—*Feb. 10.*—At Whitson, in Hitchins's engine-shaft, the men have engaged the past week cutting ground for bearer and cistern. At the south shaft, in the 30 fm. level south, we have discovered some more whole ground, looking very promising, which will set at a moderate tribute. At Fuzehill, at the engine-shaft, we have cleared and secured the 30 fm. level 8 fms. south, but no appearance of any whole ground yet. Our pitches are looking very well, and the tributers are getting wages. We have sampled 40 tons silver-lead ore, which is now ready for sale. —**B. ROBINS.**

GRAMBLER AND ST. AUBYN.—The following are the particulars of the account, held on the 10th inst.:—
Labour cost for November and December, 1845 £787 12 9
Merchants' bills for ditto ditto 363 11 3—1151 4 0
Copper ores sold, Nov. 21, 1845 £1373 14 9
Tin ores sold, January 17, 1846 76 14 11
Deduct lords' dues £1450 9 8
89 16 5—1360 13 3
Profit £ 209 9 3
Balance due pursuer to the end of October, 1845 244 0 9
Now due pursuer £34 11 6
(The prospects of the mine are much as usual.)

GREAT WHEEL WILLIAMS.—*Feb. 9.*—We have driven the high wood adit during the last month 6 fms.; the lode is about 1 ft. wide, and is composed of flookan, kilaas, muncie, and spar, with a good regular hanging wall. We have holed Vincent's shaft from the back of the adit, and thereby obtained good air in the end. We last Saturday set 10 fms. to drive in the air adit at 2l. 7s. 6d. per fm. —**B. COOKE.**

GUNN'S LAKE.—*Feb. 10.*—At Chisworthy, Bailey's engine-shaft is 3 fms. 3 ft. 6 in. below the adit level. There has been no lode taken down; ground rather hard. The adit level east is suspended. —**W. RICHARDS.**

HAWKMOOR.—*Feb. 10.*—The south engine-shaft is 18 fms. 7 in. below the surface, lode about 6 in. wide—much as last reported. The western engine-shaft is 15 fms. 5 in. below the surface—lode about 12 in. wide, composed of spar and muncie, producing stones of ore in places; the progress in this shaft has been retarded, owing to an increase of water; consequently, we have been obliged to alter the pitwork. The lode in the 15 fm. level, west of Hitchins's engine-shaft, continues about 20 in. wide, composed of capel and spar; in this level east the lode is 15 in. wide, producing good stones of ore. —**P. RICHARDS.**

HOLMBUSH.—*Feb. 10.*—The ground in Hitchins's shaft, sinking below the 110 fm. level, is still hard. In the 120 fm. level cross-cut the ground is much the same as when last reported. In the 110 fm. level, west of Hitchins's shaft, the lode is 12 in. wide, producing stones of copper ore; in the stopes in the back of the level west of Hitchins's winze, the lode is 10 in. wide, and worth 10l. per fm.; in the stopes west of the sump winze the lode is 10 in. wide, and worth 9l. per fm.; in the stopes east of Doldge's winze the lode is 10 in. wide, and worth 8l. per fm. In the 100 fm. level, west of Hitchins's shaft, on the north part, the lode is 18 in. wide, and worth 15l. per fm.; in the 100 fm. level west, on the south part, the lode is 12 in. wide, and worth 15l. per fm.; the lead lode south, at this level, is 5 ft. wide, producing stones of lead, and ground very soft. In the 90 fm. level driving north the lead lode is 2 ft. wide, and worthless; ditto driving south on ditto, the lode is 2 ft. wide, composed of spar and flookan, with spots of lead. We have commenced driving the 62 fm. level north on the cross-course, to communicate to another level, 3 ft. to the north of this level, to ventilate this part of the mine. In the rise in the back of the 80 fm. level, against Bray's shaft, the lode is small and poor. —**W. LEAN.**

LEWIS.—*Feb. 2.*—We beg to hand you our report of the above mines. Kuskey's engine shaft is 2 fms. 2 ft. under the 42 fm. level, ground favourable. The lode in the 42 fm. level end west is 2 ft. wide, composed of spar and muncie, with spots of ore, and some tin, a very kindly lode; we are also extending our cross-cuts north and south, in a favourable strata, at the 42 fm. level. Kuskey's lode on the winze, sinking under the 32 fm. level, is 15 in. wide, producing some tin. Wheel Nutt engine shaft is 6 ft. under the 50 fm. level; end west is 20 in. wide, producing some tin. The lode in the 40 fm. level end west is 20 in. wide, producing some tin. The lode in the 30 fm. level end east is 2 ft. wide, worth 30s. per fm. for tin. The lode in the 20 fm. level east is 20 inches wide producing some tin. The lode in the 10 fm. level end west is 2 ft. wide, set at 15s. per fm., and tribute 8s. in 20s. —**S. S. NOELL. P. EDDY.**

NORTH WHEEL ROSE.—*St. Agnes, Feb. 9.*—But little has been done in the flat-rod shaft since my last, the men having been engaged about cistern plat and fixing lifts, &c.; and, I regret to say, very little has been done in the pitches—the time of the men being occupied in securing the levels, which are crushing in all directions, from the continued rains; the weather has improved in the last two or three days, and I hope that the worst is over. We have sampled only 61 tons of the best parcel, and 14 tons of the second, for the last three months. The lode in the 60 is not yet cut; the branch seen in the level above, dipping west, towards the main lode, was seen last week; it has again increased in size, and contains more lead. —**W. CARNE.**

SILVER VALLEY.—*Feb. 9.*—I beg to say that the lode in the 30 fm. level, driving west is 2 ft. wide, composed of capel, spar, peach, and muncie, with some good stones of tin; in the eastern end, the lode is 3 ft. wide, 1 ft. of which is saving work for tin. The lode in the 20 fm. level west is 3 ft. wide, composed of capel, spar, and peach, producing some saving work for tin; the south shaft is about 10 fms. below the 20 fm. level; and, as soon as it is

cleared to the 30 fm. level—which, from the accounts we have of the men that were employed here in former workings, is about 12 fms. below the 20 fm. level; we shall commence to fix a plunger-lift there. —**S. RICHARDS.**

TAVY CONSOLS.—*Feb. 10.*—During the last month we have cleared 40 fms. of the deep adit, leaving about 20 fms. more to the shaft; when this is completed, we intend clearing the shaft. The whim is erected, and ready for working. At Hocklake, we have driven the cross-cut adit about 12 fms., and expect to cut the lode at 2 fms. further; the ground still continues easy. —**B. COOKE.**

TRELEIGH CONSOLS.—*Feb. 7.*—In Christie's shaft, below the 90, sinking in the country. At the 90, east of ditto, lode about 8 ft. wide—worth 36l. per fm.; ditto, west of ditto, lode 1 ft. wide, but little ore. At Garden's shaft, below the 80, lode 3 ft. wide; but little of it broke this week, but of much the same quality or value as last week. At Good Fortune shaft, below the 70, lode 3 ft. wide, with stones of ore and muncie. At the 70, west of ditto, lode 3 ft. wide, kindly, with stones of ore, and continues to improve. At the 60, west of Symons's, lode 2 ft. wide, producing stones of ore. At the 50 cross-cut north the ground is hard for breaking, and wet—expect to be near the lode. At the 50, west of ditto, lode 2 ft. wide, with stones of ore, and rather kindly—more so than last week. At the winze, below the 44, lode 1 ft. wide, but little ore. At the 34, west of ditto, lode small—no mineral. At the rise above the 20, lode 2 ft. wide, capely, and little ore. At the winze below the adit nothing done—the men putting in air-sollars, &c. —**W. SYMONS.**

UNITED HILLS.—*Feb. 10.*—In Williams's shaft the lode is 2 ft. wide, good ore. In the 80 fm. level eastern end, the lode is 3 ft. wide, ore throughout, of average quality; western end the lode is 3 ft. wide, producing some stones of ore. In the 70 fm. level, eastern end, the lode is small and unproductive; west of diagonal shaft the lode is 3 ft. wide, producing but very little ore. In the 60 fm. level, east of eastern shaft, the lode is 2 ft. wide, 18 in. ore of average quality; west of Harper's winze the lode is 3 ft. wide, 18 in. ore of low quality; in the stopes, east of Harper's winze, the lode is 2 ft. wide, good ore; in the stopes, west of James's shaft, the lode is 6 ft. wide—3 ft. on the north part, ore of average quality. In the 50 fm. level, in this cross-cut, the ground is a little improved since last reported. At Wheel Sparrow, in the 50 fm. level, the lode is 2 ft. wide, coarse in quality. In the 40 fm. level, east of Gibson's shaft, the lode is 2 ft. wide, ore throughout, of average quality; west of Gibson's, the lode is 18 in. wide, poor; east of Richards's shaft, the lode is 18 in. wide, not producing any ore. In the 30 fm. level the lode is 2 ft. wide, produce throughout of low quality. —**T. TREVENEN. R. WILLIAMS.**

WEST WHEEL JEWEL.—*Feb. 9.*—The water is still in the 100 and 115 fm. levels, but gradually forking. At the 85 fm. level west, on Wheel Jewel lode, the lode is 1 ft. wide, and worth 8l. per fm.; driven in the past month 3 fms. At the 70 fm. level west, on ditto, lode 1 ft. wide, composed of spar, muncie, and stones of copper—driven 2 fms. 5 ft. 6 in.; south 3 fms. 5 ft.; and north, on Williams's cross-course, 1 fm. At the 85 fm. level west, on Buckingham's lode, the lode is divided into two parts, both unproductive—driven 3 fms. At the 80 fm. level east, on Morcom's lode, the lode is 2 ft. wide, of a very promising character, and producing rich stones of copper—driven 5 ft. At the 12 fm. level west, on Tolcarne tin lode, the lode is 18 in. wide, and worth 6l. per fm.—driven 1 fm. At the 12 fm. level east, on ditto, the lode is worth 8l. per fm.—driven 3 fms. 2 ft. 6 in. We have completed the plunger-lift in Wilkinson's shaft, and it works well. At the deep adit west, on Wilkinson's lode, the lode is 1 ft. wide, unproductive—driven 1 fm. 5 ft. —**S. LEAN. R. JOHNS.**

WEST WHEEL BASSETT.—The following are the particulars of the account, held on the 9th inst.:—
Labour cost for July, Aug., Sept., Oct., Nov., and Dec., 1845 £466 10 2
Merchants' bills for ditto ditto 293 16 11
Loss £760 7 1
Balance due pursuer to end of June, 1845 258 11 2—1018 18 3
By seventh call, made 4th August, 1845, 5s. per 1-128th share 640 0 0

Now due pursuer £ 378 18 3
Call made this day of 5s. per 1-128th share.

Report.—The levels are of such a promising nature, as to induce us to sink the engine-shaft another 10 fms.

WHEEL BASSETT.—The following are the particulars of the account, held on the 9th inst.:—
Labour cost for November and December, 1845 £1756 1 10
Merchants' bills for ditto ditto 1070 8 2—2826 10 0
Copper ores sold November 6 and December 4, 1845 £3496 13 7
Deduct 1-20th for lords' dues 174 16 8—3391 16 11

Profit £ 495 6 11
Balance in favour last account 383 14 10
Balance at bankers £ 879 1 9

Report.—Our levels generally are not so good as they have been, but our ultimate prospects are favourable, and expect, ere long, to resume dividends.

[After charging 1070l. for merchants' bills, and adding the profit (on the sale of ores of Nov. and Dec.) of 495l., leaves in the hands of the bankers, 879l. The profit for the next account will be more, in consequence of charging a large quantity of timber, and other material, which will not be required for use within the period referred to. The general appearance of the mine are very flattering, and it is anticipated, before the next meeting, some good tin ground will be opened on, as good courses of tin in South Francis, all coming towards South Bassett, and under the present deep levels in the western part of this mine.]

WHEEL MEXICO (near Callington).—*Feb. 7.*—The 20 fm. west is slightly improved, and from this end to the cross-course, the distance is about 45 fms. The levels in the Duchy have turned out to be poorer than we anticipated—much of the best ground having been worked away; for the present, therefore, we are exploring the eastern adit. From the East Cornwall adit the tributers have taken out a small pile of silver ores during the last month; some of the stones are very rich, but the entire sample is rather of a low quality. The north lode still carries a leader of jack, occasionally also fine stones of lead and muncie, thickly spotted with copper. We have lately had the report of a mining agent in the neighbourhood, and there are many others who are ready to testify to the truth of his statement; the report of which is, that at the 20 fm. level, under the East Cornwall adit, the lode is divided into two large branches, each of which contains a rich leader of copper; and, in addition to this, the southern branch carries a small vein of silver, particularly rich. A considerable portion of the eastern ground was stopped away before the year 1825, and some thousands of pounds worth of silver ore been raised; the eastern part, however, is almost entirely in whole ground. —**W. KNOTT.**

FOREIGN MINES.

WEST INDIA MAIL.—The Royal Mail steamer, *Trent*, arrived at Southampton, on Monday: her dates are—Tampico, Dec. 25; Vera Cruz, Jan. 1; Havana, Jan. 10; Honduras, Dec. 20; Jamaica, Jan. 8; Carthagena, Dec. 29; Trinidad, Jan. 5; Barbadoes, 8; Grenada, 9; St. Thomas's, 14; Bermuda, 13; and Nassau, 13. The *Trent* has 54 passengers, and on freight \$664,877, 944 ounces of plata bruta, 25l. 4s. British money, 12,900 ounces gold dust, 3677 ounces of silver, 110 ounces of platina, 2 boxes of pearls, and a miscellaneous cargo.

ANGLO-MEXICAN.—*Guanajuato, Nov. 22.*—*Anuncion.*—The buscones have produced in the week, 450 cargas of ore, which sold for \$1446 7. The memoria of the week, including several extra charges, amounts to \$826 5 104—the loss, therefore, is \$103 2 44. The prices paid for the ore were extremely low, fully \$2 a carga less than its true value. The campos have not presented any notable change during the week, nor have the speculative works come to any decisive result. Dec. 29.—The work of buscones has in the week produced 266 cargas of ore, which sold for \$1809 1. The memoria of the week (\$664 6 3), being deducted from the one-half sale pertaining to the company, leaves a profit of \$239 6 3. The ores are believed to have been well sold, and paid for at their true value. The following is a statement of the present distribution of the campos:—In Santa Isabel, there are 3 campos on threads of ore, from 1 to 3 in. wide, rich in silver and gold, of an uncertain duration. In San Pablo pozo, there are 3 campos—2 of them against the lower wall in abundant ordinary ore, and one in a rich narrow thread in the upper wall; they are all of doubtful duration. At Buen Suceso and San Casimiro, there are 4 campos in abundant ordinary ore, with bunches of a superior class—3 of these campos have a chance for duration, as there is ground to work on. In the old workings of San Gregorio, above La Palma and San Casimiro, in the Animas workings, and in the level of San Esteban, are several campos which are being loosely worked. Notwithstanding, these works do not at present offer any particular interest, yet the united mass of ore taken therefrom, assists materially in the sales, and discoveries may be made when and where least expected. The two speculative works in progress, in search of some rich old workings, do neither of them present anything very encouraging. One of these, which is a cross-cut, seems to be approaching the vein, but with no indications as yet of old workings, although we are told it must inevitably communicate with them. This work is a continuation of an old cross-cut that has been concealed from us until quite lately, and is, in my opinion, a very desirable speculation, even if the works proposed had no existence, for the vein is before us—the cross-cut is called San Cenovio. The speculation in San Patricio, commenced as a "limpia," eventually became a cross-cut in solid ground, and, having cut (as we presume) the vein in borrasco, is now turned along the direction of the same, with the double object of testing the vein, and searching for the proposed rich old works. Dec. 6.—The buscones have in the week produced 270 cargas of ore, which sold for \$940; the memoria of the week being \$435 5 6; there results a loss of the week of \$85 5 6. The ore sold is believed to have been equal in quality with that of the previous week, but a want of competition caused it to be sold low. There is nothing worthy of notice in the speculative works. Dec. 13.—The work of buscones has produced 240 cargas of ore, which sold for \$668 5 0. The one-half of this amount, pertaining to the company, being deducted from the memoria of the week (\$785 6 4), leaves a loss of \$461 8 10. It is to be noticed that the memoria is much above the average amount, owing

to a large purchase of powder. In the speculative works, nothing has transpired worthy remark. Dec. 20.—The buscones have in the week produced 230 cargas of ore, which sold for \$946; deducting the one-half of this amount pertaining to the company from the memoria of the week (\$694 5 3), there results a loss of \$221 5 3. The speculative works are now costing about \$250 per week; they have not yet made any discoveries, but I feel every confidence that they will ere long repay the debt they are now contracting.

BOLANOS MINING COMPANY.—*San Clemente, Dec. 17.*—Since my report of the 16th ult., of which a copy is enclosed, I am in receipt of your secretary's letter of 1st Oct. I have already suspended some of the least encouraging of our workings in the San Clemente setts, and others in San Francisco de Paula have been completed, so that our outlay for the present month, on dead works, will be less than it was; and although the raising of ore had suffered a further diminution during the last three weeks, there has been an improvement in its quality generally; and, from the present appearance of the reserves, there is reason to expect they will last longer than was anticipated. The west end of La Luz likewise continues in ore of more or less value; and, above all, the winze of San Miguel, in the mine of San Francisco de Paula, already finds employment for eight pairs of men working on ores, and promises very soon to make up for all their deficiencies of ore; so that, instead of a loss on the operations of the present month, I shall expect some profit; and such is the formality of our discovery in San Francisco de Paula, that I consider we may count upon its giving permanent and increasing profit.

ZACATECAS MINES REPORT.

Extraction of ore for the month of November (four weeks):

S. Clemente.	S. Nicolas.	Disputed ground.	S. Rafael.	Total.
185'8	438'8	868'11	234'2	1727 c. 5 a.

This is an increase on the raising of October, and what is of equal interest, the leys have improved in the reserves, so that I hope this month to have tortas of 20 mcs. again. Since the end of November, as I observed before, the raisings have diminished again in the San Clemente setts; but the quality continues good, and San Rafael is likely to give 200 cargas weekly, and more than compensate the deficiency in the other mines, counting from the present week. The west end of La Luz continues with a vein of about a quarter of a vara of good ore; but, in the bottom, it splits into two branches, underlying away from each other. The west end of San Francisco has crossed the boundary line, and is now driving in Malancho—it is at present without ore. The west end of Dios nos Guis has been suspended, as, with three weeks' driving in the upper wall, the lode has not been found. The west end of San Fernando has also been suspended; this level having been driven so many hundred varas without finding silver, and because it will be tried about 70 varas further west by the new winze from La Luz. The cross-cut of La Merced, from San Nicolas shaft, has cut a lode of 2 varas width, underlying north, at about 17 varas from the shaft—it contains bronze, caldero, and other metalliferous matter, assaying 1 to 1½ mcs. per monton. This lode was seen in the cross-cut of San Fernando above it, but in perfect dead; it seems to branch off from the lode of Santo Tomas with a contrary underlie—at least, we know no other with which it can have connection. I am afraid it is hardly worth further trial; but, if our finances permit it hereafter, it will be satisfactory to drive some varas on it. The end of Animas has not yet discovered anything; it is not far enough advanced to meet the Barguena lode. The west end of Barguena has continued without signs of silver—it will be given up at the end of this month, if no discovery is made meanwhile. The cross-cut of San Jose, near the general shaft, now 5 varas in, has not yet cut the lode of San Jose.

SAN FRANCISCO DE PAULA.—The east end of San Bonifacio has again opened a narrow vein of ore, which I hope may increase in value, and open new ground for the buscones. The cross-cut south, No. 1, of 125 vara level, has communicated with the winze of San Miguel, and laid open three veins of ore of about a foot wide each, with poor azogues between them—making altogether about 2 varas width of ore; one of these veins only is of the richest sort, the rest is ordinary. This week, since we have had room for 8 pairs of men to work, I expect we shall get 150 cargas from this spot, and, as room is made for more hands, the quantity will increase. We are for the present preserving the level by breaking the ores only in the two ends and the roof. When the shaft is communicated with San Bonifacio level, and the raising of so much little rendered easy and economical, we shall commence a winze on the ore, to sink till we reach the water, and a cross-cut to the south, through the enormous width of the Rayas lode which we have to cut here. Other interesting works may be undertaken when the shaft is made available. The two ends of the west continue barren. The sinking of the shaft, since my last, has been about 3 varas weekly; it is now 77 varas deep, and may want about 12 varas to reach the level of San Bonifacio, which it will take about four weeks to drive; the cross-cut from San Bonifacio will be home before it.

IN VETA BELLA, the two workings continue without discovery; the winze continues its great underlie, and, during the last week, it has been driving as a cross-cut to seek the upper wall. It cannot yet be decided whether the vein we are sinking on has been cut in the cross-cut below of San Juan de Rayas.

CELESTINA.—At 64 varas depth from the mouth of the shaft, two cross-cuts were commenced—the one to the south, towards the Celestina lode, was driven 3 varas and stopped; and it was not my object to go further till the lode is cut in the shaft, and the water drained. The one to the north continues driving, as there is less fear of cutting water; and the lode sought for will probably be 40 varas off at this depth. The shaft has been sinking fairly, and is now 76 varas.

NIEDAS.—To 29th Nov., 16 varas of the shaft were sunk—the total cost of which was only \$98 7½; timber purchased amounted to \$116—total, \$214 7½. Since then the progress had been small, owing probably to the very low prices which M. Lizaola offers, at which he could only procure one pair of men.

P.S.—19th Dec.—Just on closing, the sentence of the tribunal has been notified to me, awarding the whole of the disputed ground to Malancho, so that the debt of this mine will be reduced immediately by the amount now at the credit—\$42,461 2 0.

Statement showing the General Result of the Mines and Haciendas for November:—

Mines.	Profit.	Loss.
San Clemente Mine.....	\$1701 1 3	4 6
San Nicolas.....	3351 4 3	—
Malancho.....	742 6 0	—
San Rafael.....	1991 3 5	—
Veta Bella.....	616 1 5	—
Loreto.....	77 6 5	—
La Celestina.....	2371 4 0	—
Disputed ground.....	\$2088 6 7	—
Haciendas.....	3648 6 0	—
Loss.....	5714 7 2	—

\$11,452 4 1 \$11,452 4 1

PACHUCA MINES.—*Dec. 24.*—*Rejona.*—Having found ground in the winze, clearing below the 215, at about 250 varas from surface, the attic was cleared to the western end of ground, samples from which assayed 2½ mcs.; here we commenced sinking; the lode is composed of hard spar and small spots of ore, and is about 1½ ft. in width. *San Miguel.*—Finding the lode in the shaft to be of a very promising nature, the sinking was suspended about the middle of the month, in order to cut it open to a regular size, and secure its mouth. This work will be completed about the end of this month, when the sinking will be resumed. *Esperanza.*—The lode in the shaft appears to be altered. The red clay, or flookan, intermixed with stones of hard spar, of which the lode was generally composed from near the surface to 10 varas below the 100; is gradually disappearing, and the vein changed from clay to light-coloured quartz and gossam. The hard stones of quartz generally contain spots of ore; there were about two bags saved last week, samples of which assayed—best, 18 mcs. per monton; common ore, 8 mcs. *San Buenaventura.*—The little ore that was met with in the 95 vara level west has again disappeared; the lode is now much the same as it was before the ore was cut, and favourable for driving; the total from shaft is 114 varas. La Grande lode, whose direction is about north-east and south-west, forms a junction with this vein, about 100 varas east of Esperanza shaft, at surface. It has not as yet been met with in the 95 vara level, but as both veins underlie towards each other, I should think that the junction would be found about 30 or 40 varas farther west. We commenced yesterday to sink a winze below this level, at the point where the ore was found, that assayed 8 mcs.; the lode is looking much the same as it did in the level. All the metal above 6 mcs. per monton will be saved apart, and that above 8 mcs. will be removed to Rejona. *Gaudalope.*—The cross-cut south of 108, east of shaft, was driven 6 varas, and, finding no appearance of the lode, it was suspended. We are now driving a cross-cut 8 deg. east of north, in order to cut the other large lode, which runs nearly parallel with that of Santa Clara, the distance from one lode to the other appears to be about 26 fms. at surface—both of north underlie. It will be a very interesting matter to see this lode cut at the 108, as it has a very promising appearance at surface; the cross-cut is driven 1½ varas, and the ground is not hard. The cutting open of the shaft, below the 108, has been commenced, with a view to sink it for another level. The ground is not hard, and I hope this work will be carried on at a very moderate expense. The costs for November amount to \$729.

REAL DEL MONTE.—*Mineral del Monte, Dec. 28.*—I beg to acknowledge the receipt of your despatches, of the 23d of October, which came to hand on the 19th inst. The opinion expressed by the directors, that permanent profits from this concern must depend on the extension of the hacienda power, for the reduction of the poorer class of ores, perfectly coincides with my own, as you will have noticed frequently mentioned in former letters; I, therefore, fully enter into their views, with respect to San Antonio, and purpose using every endeavour to forward this important work, with as little delay as possible; circumstances, however, have prevented our proceeding with this establishment hitherto with that vigour which might be deemed advisable. In the first place, our funds have occasionally been low, added to which we have been driven to incur extra expenditure, in the erection of a new engine at Acosta; besides which, we still find it necessary to replace the old engine by that of Terceros. In addition to the foregoing, the alteration at Sanchez, described last month, will all tend to the delay of the works at San Antonio. By the

MINES IN THE CALLINGTON DISTRICT.—(Continued.)

In the last brief sketch of the mines in the Callington district [see *Mining Journal*, Jan. 3], it was remarked, that the far-famed Wheal Maria stands first in the list of copper mines. The beautiful gossan of the Bedford Mines and Gunnis Lake, and of other sets in the neighbourhood of Tavistock, was a pretty sure indication to the old miner that rich deposits were reposing beneath their ochreous beds; but not the most sanguine ever dreamt that an immense mass of ore lay buried at a comparatively short distance from an abandoned mine. To the west of Wheal Maria are two sets (Wheal Fortescue and West Wheal Maria), both of these are favourite speculations—the former being the larger set, although not so conveniently situated; and if a change of stratum did not appear (on surface at least), there would be no reason why the Maria lode should not continue equally valuable in both these mines. The same remarks will, of course, apply to Wheal Williams and Lamerhoo, and would, therefore, merely hint, that the relative situation of all these new advantages can be best understood by reference to maps of the sets, lately published, adjacent to the Great Maria. South Wheal Maria is also a mine of some promise, and is not far from Hawkmoor, which latter, as well as Gunnis Lake, stand favourable in the market. Gunnis Lake is an old mine now being worked with considerable spirit; once it was one of the most valuable mines in the district, and rich specimens of native copper, green carbonate, and red oxide, were found in abundance. To the east of Gunnis Lake and in killas are the Bedford Mines, which appear, from the weekly reports, to be returning a fair proportion of ore, and to be working at a profit. Holmush is situated to the west of Kit Hill. In this mine, quantities of ore have been found near the surface; and the rich lode lately discovered, adjoining the cross-course, at the 100 fm. level, with the aid of the newly-erected engine (an 80-in. cylinder), will, in all probability, enable her to maintain her former position, notwithstanding the discouraging effect lately produced, in consequence of meeting with a hard floor of ironstone. Wheal Martha, to the north-east, is undergoing an effective trial; and it is hoped that perseverance, such as is here witnessed, will meet with its due reward. Several tons of copper have been sold at different times, and it is the opinion of practical agents that the mine is improving in depth. For the present, the levels are drained by water power; it has also been decided, however, to employ the aid of steam. The principal tin mine in the district is Drake Walls, which is looked upon—whether too confidently or not is a matter of opinion—more as an investment than a speculation. The killas is generally of a dark blue, though occasionally there is a green tint on the slate; and the lode is traversed by small veins of the oxide of tin, through which many cross-courses pass. The engine is a 40-in. cylinder, and in good order, which also works several stamp heads, and a powerful water-wheel is employed for drawing up the stuff. On the summit of Kit Hill, tin ore was also found in small veins of a very pure quality; here a windmill was erected a few years since, which, for a time, effectually drained the shaft, until a sudden storm wrecked the mill machine, and with it the hopes of the adventurers. The north lode in Silver Valley is producing some good stones of tin; there being a tin, copper, and silver lode in this set, only a few fathoms distant from each other, which the new engine, a combined 50 in. cylinder, is quite able to command. The Bedford Mines are also returning some good tin from one of the lodes. Having shadowed forth these few remarks on the Callington district, the details and specific points of the several mines alluded to being at all times easily procurable from the agents of the respective mines in the eastern district, is very similar to that in the western, and in almost all the principal copper mines, rich gossan is found on the backs of the lode; it cannot, moreover, fail to be noticed—it being a trite saying—that the ore is evidently more plentiful either at the junction of the granite and slate, or at no great distance from it; and for this reason, to venture an opinion, because the rock, whether granite or killas, appears to be more felspathic—i.e., it contains more potash and less silica—at or near the line of demarcation; neither should be overlooked the influence which cross-courses and elvan-courses evidently exert over the different deposits of ore. To quote the able observations of Mr. Henwood, in his admirable work on metalliferous deposits—"A more extended experience, and a more careful generalisation of facts, seem to afford the only remedy in this branch of science, and, if our conjectures fall of actual certainty, they will at least lead to a closer approximation to the truth."

BOLANOS MINING COMPANY.—The following is an extract from a broker's circular, dated February 12:—"The Mexican mail has brought the Zacatecas accounts of November to the Bolanos Company. There is a loss in the month of \$5714, which was to be expected from the preparatory dead works in the mines of San Rafael (which includes San Francisco) and Celestina—indeed, these, with Vata Bella and Louto, in the same district, make nearly the whole sum. But against this we have a set off. You know the 'disputed ground' runs in a very narrow strip between Malancho and San Nicolas, and the ground has been claimed by the owners of each mine. It is decided by the Mining Tribunal in favour of Malancho, and, in consequence, the Bolanos Company receive the whole of the profits, \$42,461, in part payment of the debt due from the Malancho Mine. Had the decision been in favour of San Nicolas, as that mine is not (I believe) in debt to the company, 5-12ths of the sum (\$17,690) would have been to be paid over, but it is now returned. A new discovery in San Francisco de Paula appears to be important. Mr. Penny describes it, as having laid open three veins of ore, or about a foot width each, with poor azogues between them, making altogether about two varas (nearly 6 ft.) width of ore. One of these veins is of the richest sort, the other two ordinary; the remaining three feet being what he calls poor azogues. The discovery promises, he says, very soon to make up for all deficiencies of ores; and, he adds, such is the formality of our discovery, that I consider we may count upon its giving permanent and increasing profit."

FOREIGN ORES.—In the House of Commons, on Tuesday evening, Mr. Muntz presented a petition from Birmingham, numerous signed by merchants, traders, and manufacturers, regretting that the Government plan of reductions of duties did not include copper ore.

CALLINGTON MINES.—Three miners, named James, Kelly, and Vasey, have been committed for trial, charged with stealing from these mines a quantity of candles and gunpowder.

BIRCH TOR MINE.—The report from this mine, dated the 2d of February, says, that since July last the shallow level east on Birch Tor lode has been cleared and secured to the end, and driven 32 fathoms. A rise has been made in the back of the shallow level between six and seven fathoms high, which will be continued to a level called Matthews' level. The middle level, east on Birch Tor lode, has been cleared and secured to the end, a distance of 70 fms. The level is now suspended for want of a sufficient supply of air. The deep adit east on Birch Tor lode has been cleared and secured, and since driven seven fathoms. The deep adit west on Birch Tor lode has been cleared and secured 15 fathoms west of the walled shaft. The water has been forked to the 40 fathom level, and the level cleared and secured to the east end. The latter end of this week the 40' east will be driven, and in about three weeks the 50 fathoms level east is to be commenced also. The Vitefer deep adit has been cleared and secured about 300 fathoms. The cost for February and March will be about 7000; April and May 7000. To meet this they could fairly calculate on raising tin in Feb. and March worth 4000; April and May 6000. This will leave 4000 to be provided for from end of Jan.—*Plymouth Jour.*

MINE ACCIDENTS.

Police Mines.—Z. Mills was dreadfully injured by the falling of a piece of timber down the shaft in which he was at work.

The late Explosion at Risco.—The coroner's jury, having again assembled at the Albert Inn, Risco, to investigate the causes of the late calamitous explosion of fire damp, after a careful examination of witnesses, which occupied nearly 6 hours, returned a general verdict of "accidental death."—Sir T. Phillips, the barrister, was brought down specially by Russell and Co., the proprietors.

Princes Risborough, Clydach.—E. Williams was killed by the upsetting of the clay-rolls.

Duck Furnaces, Dudley.—While several men were in the counting-house, adjoining the blast furnaces, the roof fell in with a dreadful crash, and killing T. Maycock, and severely wounding several others.

Widnesbury.—J. Pitt was killed by a fall of coal in Messrs. Botteley's colliery.

Oldbury.—J. Franks was killed by fall of coal in one of Messrs. Haines and Hartland's pits.

West Bromwich.—A frightful accident occurred, at the works of Mr. Davies, of Crookhay, to R. Grigg, who was running off some hot metal; but, finding it flowed in a greater body than he expected, attempted to turn the fiery current into another casting receptacle, when, in his haste, he foot caught a piece of iron, and he was precipitated full length into the red-hot liquid iron!

Garnonsdown Moor Pit.—J. Todd, a trapper, aged 11 years, was killed while seeking employ in this pit.

Quariton.—As R. Scholes, aged 8 years, and 13 other boys, besides a number of miners, were working in a pit, one of the men struck into an old mine which had been standing 36 years, when the water rushed upon them, and they were driven forward to the pit shaft. The men assisted in getting the boys out, and they were all rescued but Scholes, who was drowned.

Dunblair.—H. Bowen was killed by a fall of coal.—W. Jones was also killed by a similar accident.

Rhymney Iron Works.—J. Lewis was killed by a fall of coal.

Ridgely Iron Works.—W. Armstrong was killed in the Noulstone drift.

Explosion of Gunpowder at Maseley.—A melancholy accident occurred—owing to the too common practice of allowing miners to have in their possession large quantities of powder, sometimes as much as 2 or 3 cwt.—at the house of Joseph Price, a collier at Mr. Frimston's iron-works, by the explosion of a quarter cask of powder, by which Price's wife and two children were killed.

Capefield Colliery, Bilsda.—P. Spooner was killed by a fall of "clod."

Knowles's Field Colliery, Bilsda.—H. Lewis (aged nine years) was killed while following his employ as a "gin driver" at Messrs. Taylor's.

Cray Cross Colliery.—P. Cowley was killed by an explosion of fire damp.

WHEAL WILLIAMS—DUCHY OF CORNWALL.

Sir,—As your valuable Journal may be considered a sort of palladium of the mining interests of Cornwall, I take the liberty of calling your attention to a most unusual, and I believe unprecedented, bargain which has been recently made by, and between, the officers of the Duchy of Cornwall, and the grantees, or takers, of a set within one of the Duchy manors of a mine, called Wheal Williams. You are aware, Sir, that in all the Duchy manors, the minerals belong to the Duke of Cornwall, who exercises the same rights over them, as any other individual would over the minerals in his own freehold. The course of procedure, therefore, indicated to the officers of the Duchy, in the granting of mine sets, would be that which any other prudent and liberal lord would pursue; and that course has hitherto (perhaps, without an exception) been as follows—viz., on an application being made, the *toller*, or mining agent of the lord, considers the run of the lodes, the facilities for working a mine, and the quality and value of the land likely to be injured by the workings; and advises the lord to grant the set in consideration of a certain part of the minerals, or of the money for which such part of the minerals shall be sold, being reserved to him as dues or rent; the part so reserved varying, according to circumstances, from 1-12 to 1-24th. But in the mine in question (Wheal Williams), the advisers or officers of the Duke of Cornwall, having held out the set to public competition, as being likely to contain the Great Wheal Maria lode in it, reserve to his royal highness 1-12th dues, and 80 per cent. of the profits—thus taking advantage of the locality in a manner unexampled, and I may venture to add, wholly unworthy of the grantor. This, however, is not the only remarkable part of the transaction; for, by this participation in the profits, the grantor of the set has actually become a partner in the mine, and liable for the supplies and debts of the same! Was ever an heir apparent of the Crown of these realms before placed in such a position! If any one, on the part of the Duchy, should be bold enough to dispute this last point, you shall have another letter from—A CORNISH MINER: *Truro, Feb. 10.*

"THE STANDARD."

Sir,—As a reader of your valuable Journal, I have frequently been unable to understand the precise meaning and application of the term "Standard," used in the reports of the sales of copper ore which take place from time to time in England. If it be in your power to throw some light upon this subject, you will very much oblige several regular readers of your Journal in this country.—*Baltimore, Maryland, Dec. 27.* HENRY LA REINSTRIE.

[The particulars have, on several occasions, been given in the Journal; but, for the information of our distant readers, and others interested, we re-print the explanation of the term "standard," as given by our correspondent, Mr. John Budge, of Callington:—

"The word 'standard,' divested of its masquerade dress, as applied to mining, simply means 'the present value of a ton of fine copper;' and to be understood, as to its practice effect, it must be associated with its two near kinsmen—'price' and 'produce.' Standing separately, they may be thus defined, viz.—'Standard'—the value of a ton of copper. 'Produce'—the number of tons of copper in 100 tons of ore. 'Price'—the value of a ton of copper ore."

Now, it will be seen, that any two of these terms being given, the third may be obtained by proportion. For example:—Let us suppose a case of the standard and produce being given to find the price of a parcel of ore per ton—say standard 116½, produce 8½.

OPERATION.	
As 116 : 8½ :: 100 :	72½
8½	
928	
58	
29	
10,15	
20	
3,00—£10 3 0	
Deduct returning charge	2 13 0
£7 8 0—net value of a ton of ore.	

Again: suppose the 'price' and 'produce' given to find the standard at which the ore has been sold—say, price (as above) 107 3s. per ton, produce ditto 8½, required the standard?

OPERATION.	
As £10 3 0 : 100 :: 8½ :	103-20
1000	
10	
5	
875 : 1015 (116	
Answer—Standard, 116 proof.	

Lastly: suppose standard and price given to find the produce—say, again, standard 116½, gross price 107 3s., required the produce?

OPERATION.	
As £10 3 0 : 100 :: 116 :	103-20
116 : 1015 (875	
928	
870	
812	
580	
580	
Answer—Produce 875, or 8½, as before.	

These operations prove the truth of the rules, and, I suppose, will make the meaning and effect of the word 'standard' clear to all parties, even to those who, through total inexperience of practical mining, can't tell the difference between a winze and a winze kibble."

UPTON AND ROBERTS'S SAFETY LAMP—BIRAM'S ANEMOMETER.

Sir,—I think that Dr. Murray has been rather too precipitate in the conclusions he has come to with reference to the extinction of Upton and Roberts's Safety Lamp, as stated by your correspondent "A Miner." I believe that I was the first person who tried that lamp in an inflammable mixture underground; and, in a communication to the *Mechanics' Magazine*, nearly ten years ago, I pointed out some defects in the mechanical construction, which have been since partly corrected. In using this lamp, I can confirm the testimony of "A Miner," as to the difficulty in keeping it alight, and that, not in an impure atmosphere, as Dr. Murray would insinuate, but on the surface of the ground, where I have found much trouble in carrying it to the mouth of the shaft before descending; and I have also experienced that it will extinguish itself if gently waved in the hand whilst being carried on the airways, and that, too, where there has been no presence of inflammable gas. What may be the real cause of this unfortunate effect in this otherwise valuable lamp, I am not prepared to say, but I imagine that it will be found to be deeper than Dr. Murray has conjectured. If I were to hazard an opinion on the subject, I should suggest, that the object of destroying internal combustion, at a certain stage, has been carried out too closely, and an imperfect supply of air for ordinary requirements is the consequence.

With your permission, Mr. Editor, I will take this opportunity of calling your attention to a very valuable instrument for measuring the velocity of the current of air in mines, and which has long been a great desideratum with mining viewers. This instrument is Biram's Patent Anemometer, manufactured by Davis, of Derby, and consists of a wind-wheel, having vanes, or sails, so formed, that the action of the wind upon every part of them tends to produce one revolution of the wheel in the same time that the wind travels two feet. By measuring the area of the air-course in which the machine is placed, and observing the revolutions it makes per minute, the velocity and quantity of air passing through the mine is ascertained sufficiently near for all practical purposes; and I have great pleasure in stating, that I have already found it, in practice, to be a very valuable adjunct in this most important department of mining operations. For registering the current of air for a length of time, the instrument is mounted on a frame, and connected with wheel work, which gives motion to three indices, whose united revolutions mark the passage of 1,000,000 ft. of air. This, I consider, to be a most valuable addition—enabling the viewer, as it does, after a considerable absence, to ascertain the quantity of air that has passed through the works; and thus, in case of observed deficiency leading him to search for the cause, whether it be from neglect of the furnaces, or arising from natural or other causes. So important do I consider this ingenious instrument, that, for the future, I should look upon any Government inquiry to be incomplete that had not benefited by its services; and most gratified shall I feel if this humble notice should serve to draw attention to this important invention, and cause its merits to be more generally known and appreciated.

Kilburn, near Derby, Feb. 10.

DR. CLANNY'S SAFETY LAMP.

Sir,—Having been practically engaged in the mines of the north for many years, and knowing the practice and mode of working of almost every one of them, it is with very great surprise that I see it asserted, in a communication in last week's Journal, signed "W. Reid Canby, M.D.," that his lamp has been "in use for several years, in some of our best coal mines in the north of England." Now, I assure you that there is not a single mine in the north of England which uses, or ever did use, any lamp of Dr. Clanny's. If there be, he can, of course, name the mine, and I request of him to do so, sustained by the viewer's certificate; for, in a matter of this kind, which concerns so much the lives of pitmen, it is important that no appearance of practical authority, in favour of his very dangerous lamp, should, unfoundedly, be permitted. To ex-

pect pitmen to work with a lamp, having only a little glass for protection in a fiery mine, is to know nothing of their common sense. Lamps are not unfrequently at red heat in dangerous workings, where the gas produces so great a flame in them, and to pretend that glass will not be effected, if water accidentally drop upon it when in this state, and produce no fracture, is to draw largely on credulity, and teach a most dangerous doctrine. The learned doctor ought to know that the thicker the glass the greater the danger; for that, on the application of heat to it, from its irregularity of expansion and tension of the external circumference of the cylinder, it breaks much easier and sooner than thin glass. Everybody is aware of this fact; and that, instead of giving security, it only increases danger. You will find how a glass of this description in Dr. Clanny's lamp operates, on referring to the 8vo. edition of Sir Humphrey Davy's works, vol. 6, page 106—for there you will see that M. Gosart, President of the Chamber of Commerce of Mons, in his Report on the Safety Lamp, states:—"That a director of the works having descended into the colliery of Tapatouts, with a lamp of which the base of the cylinder was of glass, a drop of water fell upon, and broke the glass, and detached a piece, which would have opened a communication for explosion; but the air fortunately, at the moment, was not adulterated with fire damp." Further, in the *Report of the South Shields Committee*, which, I perceive, speaks very favourably of the principle of Dr. Clanny's lamp, far beyond its merits, there is the following strong expression of opinion against the unprotected glass cylinder which he is attempting to foist upon the pitmen.—"A lamp which the doctor has placed before the committee on this principle, but with a naked projecting globe of strong glass, without any external wire gauze, is perfectly inadmissible for the reason just assigned—the facility of fracture of the glass;" and they add, "a visit to a glass-work will show at once how a drop of water, or even the surface of cold steel, will instantaneously separate masses of hot glass nearly an inch in thickness. To such a probable contingency as the fracture of a glass cylinder, then, this committee are unwilling to commit the safety of a whole mine." And so say I—and so will every man say, who has no crotchet or self-interested object to sustain. The learned doctor makes also a most improper and incorrect assertion about the Davy lamp; it invariably has nearly 800 apertures to the square inch, never less than 784; and I never heard of one employed in any mine in this district with 700, as the doctor asserts. Should the doctor make any statement in reply to this communication, I trust he will be precise as to facts, and have them clearly authenticated, the *who*, the *how*, the *when*, and the *where*.—AN UNDERVIEWER: *Newcastle, Feb. 10.*

AMERICAN COPPER MINES.

Although the papers contain occasional notices of the great mineral region of Lake Superior, recently opened to the enterprise of our citizens, there is an unaccountable scarcity of facts and results in the communications thus far made to the public. There is a disposition among the knowing ones in this business to monopolise the most valuable of those lands; and this design can be best accomplished by permitting Congress and men of capital generally to remain in ignorance until the choicest locations are secured. We think it important to a judicious administration of this property by the Government, and to a prompt and profitable development of its resources, that whatever can be known in relation to it should be made public. Having had access to some authentic sources of information on this subject, we shall communicate what we have learned. The copper region commences at Chocolate River, a little east of Copper Harbour, in Lake Superior, and extends along the southern shores of that lake some 350 miles to the British line, pursuing a north-westerly direction. The width is from 1 to 25 miles, according to the course of the ranges of trap rock, the uniform concomitant of the ore. This region abounds in evidence of ancient volcanic action, particularly in the frequent appearance among the ore of bodies of native copper. The ore appears in veins on the surface of the earth, and in rocks on hill sides. These veins vary in width from 6 inches to 16 feet. Some of them descend into the earth perpendicularly, others at various degrees of inclination, and some of them, after performing a curvature under the earth, reappear, or 'crop out' again. The ore yield, on an average, about 25 per cent. of pure copper, the purest in the world. The mines of Cornwall, in England, yield only from eight to nine per cent.; those of Bohemia about 15. The only mines in the world—except those of Cuba and Jamaica, of which we are ignorant—that rival in richness the mines of Lake Superior are those of Russia. The latter also are the only ones which are worked with equal facility, being like the Superior mines, near the surface, and yielding, from the very commencement of operation, ample supplies of metal. The mines of Cornwall and Hungary are worked to a depth of 2500 feet, and in some cases the first 500 feet have been excavated at an expense of 300,000 dollars to 500,000 dollars before anything was realised. No shaft on Lake Superior has as yet been sunk to a greater depth than 100 feet. It is remarkable that a copper vein never fails unless it crops out elsewhere. Interruptions, faults may occur, but continued digging will strike the ore again.

The cost of getting ore to the surface is about four dollars per ton, one hand being able to get out about half a ton per day. The cost of smelting or washing, so far, is about half that price—say altogether, six dollars per ton. If the ore yield 25 per cent. of metal, it is worth, at 16 cents per lb., 80 dollars; thus leaving a large margin for profit, after the expenses of working the mines are paid. Such operations have, of course, attracted operators, who have proceeded with equal celerity and silence to explore and appropriate the localities affording the best indications of metal. Our Government, so far, has adopted the policy of leasing at first in tracts of nine miles square, now of one only. The leases continue for nine years, at a rent of six per cent. of the ore for the first three years, and 10 per cent. for the residue of the period, the tenant giving security for the due payment of the Government share, and renewing the bond every three years. Operations were commenced by two companies in 1844. In 1845, 12 more companies have begun working. The following is a list of the names of these companies, the number and estimated value of their shares, the number of hands they respectively employ, and their trustees or officers. The amount of money required to prosecute these undertakings rendered it expedient to form associations for the purpose. To obtain acts of incorporation, however, would involve too much trouble and delay. The plan has therefore been adopted of vesting the title of the property held by the several companies in separate sets of trustees, according to articles of agreement which specify their duties and prohibit the contracting of debts; so that a stockholder incurs no risk whatever of incurring liabilities that may affect his individual property.

Names.	Shares.	Value.	Owners.	First trustee.
Lake Superior Mining Co.	1200	\$360	120	David Henshaw.
Pittsburg and Boston	5000	90	30	Dr. Thos. Jones.
Ile Royale	2000	140	12	— " —
New York and Lake Superior	5500	23	40	— " —
Bohemian	1500	50	18	— " —
Boston	2500	40	18	— " —
Eagle Harbour	3000	40	17	— " —
North West	2500	30	6	— " —
North American	3000	40	10	— " —
Ontonagon	2500	25	8	— " —
Copper Falls	3000	30	10	— " —
Superior	3000	60	8	— " —
Chippewa	1200	50	8	— " —

The locations of these companies are generally in the neighbourhood of Copper Harbour, or Kewena Point; these selections having been made not only for the apparent superiority in the quantity of ore, but from the convenience to navigation, so that supplies of provisions and lands can be easily procured, and the ore or metal be cheaply transmitted to market.

The two companies which commenced in 1844 are now ready with ores for smelting or washing. The Lake Superior Company has 1100 tons on hand. The Pittsburg and Boston some hundred tons, having been extensively engaged in preparations. In addition to these companies in actual operation, about 30 others have been formed, which will average about 2500 shares, at 10 dollars a share. The total of all these stocks is about 2,500,000. It does not seem to be extravagant to estimate that all these associations, when at work, will bring into market a sufficient quantity of copper to amount to 300,000 dollars per annum beyond their expenses. 10 or 1200 tons would be enough to pay expenses and produce that sum, and thus make the stock good for 12 per cent. on its estimated value. Our importations of copper, now made from abroad, largely exceed this quantity. There are, however, unquestionably, expectations entertained by the several companies of supplying much larger quantities than this. And from the enterprise, skill, and energy of our people, we think that will be the case. The universal use of the metal in civilised countries, and the great extension of the demand that would ensue from a slight reduction of price, give ample assurance of an adequate and profitable market.

We understand that it requires but a small sum, some 3000 or 4000 dollars, to commence these operations in mining profitably; although, perhaps, much larger sums might be advantageously employed. The companies already formed, however, not being under the necessity of making great outlays, nor of waiting long for returns, will not be compelled to force large quantities of stock on the market, and will be able to realise for themselves the fruit of that sagacity and energy that have given them the lead in this undertaking. We almost forgot to state that the Lake Superior Company, at Eagle River; the Superior Company, near Copper Harbour; and the Ontonagon, on the Elm River, have found in their ores a large proportion of silver, a quantity so great as to yield, on its separation from the copper, an additional profit, greater than that of the copper itself.—*Boston Post.*

We understand a quarry of excellent marble has been discovered at Aberfoyle, on the estate of the Duke of Montrose, and near to the line of the Forth and Clyde Railway. As the supply is almost inexhaustible, should it realise the expectations formed of it by competent judges, it will prove very beneficial to the country, as well as a profitable source of revenue, both to the railway and the noble proprietor to whom it belongs.

A quarry of marble, said to be equal in beauty to the marbles of Sienna, of Bologna, has been discovered on the left bank of the River Oise, in France.

Original Correspondence.

THE LEAD TRADE OF THE UNITED STATES.

SIR,—Permit me to make a few observations upon the letter which appeared in your Journal of the 31st ult., signed "G. B., American Institute, New York," and purporting to be a reply to my communication, inserted in the *Mining Journal*, Nov. 8, relative to the lead trade of the United States. I was somewhat surprised at the appearance of "G. B.'s" letter, simultaneously with another of mine on the same subject, and in the same column, of your Number of the 31st ult. A gentlemanly and respectful spirit pervades throughout "G. B.'s" letter, which I shall endeavour to imitate in the few remarks I have to make in reply to it. In noticing, as I have done now for some years past, the *paragrapic* report of the astounding mining operations in the American States, which have appeared from time to time in the newspapers, I was prompted alone by the interest I felt in the prosperity and welfare of British mining. No one who read those reports could fail to observe the animus or purport of them. They were like the rest of Jonathan's numerous bolts—levelled at us as their greatest and most powerful rival, as a commercial and mercantile nation. This is not grateful, inasmuch as we are their best customers for more than one article of, as yet, exclusive native growth. The British lead miner was told repeatedly, that not only should he be kicked out of every port—east, west, north, and south—but that his home market, also, should be invaded and glutted with American pig lead and lead ore, at something like the price of 13*l*. per ton. For a time, at least, this extraordinary bounce was read and swallowed as fact, by many of the first-rate lead merchants in the city of London. I have heard them frequently remark, that the lead mining interest in this country was "doomed"—that it would be utterly impossible for John Bull to compete with Jonathan in either the home or foreign markets. Having, however, learnt from other parties, who knew more about American lead mining practically than the aforesaid merchants, that it was nothing but empty bombast, that a spirit had taken place in the surface mines—the owners (chiefly the workmen themselves) of which, being much pressed for cash, poured into the foreign ports all the pig lead they could muster at a ruinous price (none of it, as I have already shown, by certain returns, has been paid duty on here)—and having access to the file at the North and South American Coffee-house, I was enabled soon to arrive at the conclusion, that this state of things would soon terminate—that, in a short period, all would be right again in respect to the interests of the British miner. He has been satisfied with his position as to price and demand, both at home and abroad, during the past year, and the present one bids fair to be equally active and prosperous.

If you have carefully perused the letter of "G. B." you will see, at a glance, how strongly he confirms the truth of all I have written to you upon the exaggerated accounts that have appeared in the public prints, touching American lead mining. "G. B." tells us in the plainest English, that those "mining operations are mere pits in the diluvium"—that is, the workings are limited to a small depth below the surface; and so indifferent are the boasting and speculating Americans about those eldoradoes, that they will not expend a farthing in excavating the rock beneath this diluvium; that no horse-whim or steam-engine is to be met with—only the simple windlass and kibble is in use: where the water becomes troublesome, the miner abandons his position, sinks a new pit, either on the same vein, or on a new one, which his knowledge of the indications on the surface soon enables him to find. With all due respect to "G. B." I am inclined to think that Professor Lyell will smile at the usage those large and productive galena deposits in the diluvium receive at the hand of the American miners. When one first saw and read those flaming accounts of the vast extent and richness of the lead deposits in the western states of Missouri and Illinois, and the territories of Wisconsin and Iowa,—to which districts the entire produce of American lead is confined—one naturally concluded that such magnificent properties belonged to a body of wealthy and enterprising men, located in New York, Boston, or New Orleans—men of great commercial and mercantile character, who would push the necessary mining operations, aided and assisted by the sound judgment and practical experience of one or more agents, or captains, as they are called,—and have carried all before them, in the States and out of them, closed the ports of America, of India, China, the Baltic, and other European depositories for lead. But "G. B." wholly upsets these utopian dreamings. He tells us, that "over this extended district, many hundred miles in extent, lead mining is carried on by small groups of miners, working on their own account, or on account of small adventures, with no large companies or accumulation of capital; the galena raised by them is sold at the mines, or delivered at the nearest smelting-works, at a price per 1000 lbs." The smelting establishments are more extensive concerns; but even these are associations of a few individuals with small means, and scattered over a very large area." This is enough; it is the testimony of an American gentleman; it is "a plain unvarnished tale," presenting a striking contrast to the reports of the discoveries of stupendous caves, composed of one vast mass of glittering solid lead ore, we often meet with in the form of paragraphs in the columns of the "best of all possible public instructors," the newspapers. I look upon those paragraphs as so many instruments by which you may pick a wealthy imbecile's pocket, by seducing him to join with others equally knowing to embark in exploring those wonderful will-o'-the-wisps. Enough; I shall make a few brief remarks on "G. B.'s" statistics of the produce of lead.

He says, "The produce of the United States' mines will, probably, reach 22,000 tons annually." Perhaps it may; but I think not in my lifetime, unless a material change is made in the conducting of their mining operations. "G. B." gives "46,000,000 lbs. as the produce of 1844, officially; and as the quantity is steadily increasing, and much escapes the notice of Government, it is, probably, safe to assume the result for the present year will be as above." I repeat, if they poke on getting on after this fashion, they will not raise more than two-thirds of the quantity named by "G. B." My report for 1844 differs widely from "G. B.'s," and yet I copied it from the American papers, at the coffee-house already named. Mine was 31,260,000 lbs., or, as I stated to you, 14,000 tons in English weight; his would amount to 19,000 tons in round numbers—a great discrepancy between us. I will not stop to inquire which of the two returns is the correct one? What I am now going to will prove, that the English have nothing to fear from any extent of competition with America in the article of lead. The operations of the lead markets—the annual produce, and quantity exported—its superior quality for a variety of purposes to that of America—its richness in silver, &c.—will show and prove to all thinking men, that we have nothing to dread (if even Sir Robert should, in a spirit of immense liberality, sweep off the remaining paltry duty of 1*l*. per ton on pig lead, imported for home consumption) from any competitor. Allow me to correct a serious blunder in my last, dated 30th ult. In stating the amount of produce, in 1844, for America, Spain, and England, I put down the quantity, for the best, as from 15,000 to 16,000 tons! This is only the amount of our exports for that year, and not the entire produce—no, a little more than one-third of it. In your Journal, of July 1, 1837, you will find the quantity of lead raised in Great Britain, including the Isle of Man, was estimated at 46,112 tons. Its average, since that year, has never been much below this quantity; and of this quantity we export rather more than one-third annually. I give you the exports of lead from 1839:—Exports of British lead, for year ending Jan. 5, 1840, 10,469 tons; in 1841, 13,224; in 1842, 12,690; in 1843, 20,205; in 1844, 14,611; in 1845, 15,664. These are copied from the Parliamentary returns, published by Hansard, and are moved for by such as Sir C. Lemon, and other representatives of the mining counties, and are, therefore, official. "G. B.'s" official return of exports, from June 30, 1843, to June 30, 1844, to all parts of the globe, gives a total of 18,420,407 lbs., or 8223 tons—little more than half the amount of our annual exports. Our home consumption, added to the quantity exported, gives an annual produce of more than double that of the United States. Then what have we to be alarmed at? Certainly not at American competition; nor Spain, now unhappily bed-ridden in its energies by revolution. "G. B." makes out 1861 tons of American lead as exported to Great Britain, and its dependencies; and although, as he admits "J. W." correct in stating the quantity entered for home consumption, yet this enormous quantity, of 1861 tons, going into the general markets, must have its influence on the mines of Great Britain. This will not do, Mr. "G. B."! This paltry quantity, thrown into the general market, can have no effect on the British miners' interests; it is, Sir, something of a more local nature that weighs us down, not your exports—it is an incubus in the shape of a heavy memorial duty,

levied upon the lead ore when made ready to enter the furnace, and which goes into the pockets of a proud and overbearing aristocracy. It is this we feel, and not your exports. A parting word to you, for you are a gentleman; in the *Mining Journal*, of Saturday last, I noticed these words in a broker's circular—"There is no prospect of importations from America, where the price is higher than it is here. English lead is 10*s*. per ton higher."—J. W.: *Pimlico*, January 12.

MANUFACTURE OF IRON IN AMERICA.

SIR,—Your correspondent, "J. W.," in his letter, dated Pimlico, Jan. 30, seems to make light of Mr. Rubio's statements, concerning the iron ores of America being beaten into rough implements at once; nevertheless, I believe it to be the case. A friend of mine, who spent several years in America, states that the iron ores of that part where he resided, were reduced into wrought-iron by the first process, and might be worked up at once without being allowed to cool; and, further, he states they could never obtain cast-iron from the said ores, and I have seen iron glance (specular iron), and brown hematite iron ores, smelted with the same result, charcoal being the fuel used; and I have by me the Report of the Calcutta Coal and Mineral Committee, by which I learn (page 70), that they failed, in an experiment on the ores of the Adji district, to obtain cast-iron; whilst in the same report (page 24), they describe the process of obtaining wrought-iron from the ores at once. I am no iron smelter, but I shall feel much obliged, if some one of your correspondents will point out why those rich ores, when smelted on a small scale, should assume the nature of wrought-iron?—Ex-RUBIO: *Norwich*, Feb. 5.

RAILWAYS IN INDIA.—WHERE IS THE IRON TO COME FROM?

SIR,—The iron mines of India, though at present doing comparatively little, might be made to supply all the wants of India in this respect. In addition to those places, mentioned by the writer in the *Bombay Times*, there are many others, where iron ores and fuel are found in abundance. Sylhet, for instance, which produces 1650 tons of iron per annum, at 5*l*. 12*s*. per ton, Mysore, Travancore, Tenasserim, and the neighbourhood of the Burdwan coal mines. There are, I have no doubt, vast deposits of iron ore in good localities in India, which remain unnoticed; for instance, at Chunar Clay iron ores are used for repairing the roads, and no one seems aware that it is fit for any other purpose; lastly, the writer notices the mines of the Almora range, which, he states, with other mines, produce iron so bad, that "one-third of it is lost in working up;" this is not always the case, for some of the iron, especially that from Khetasree, is very good, and, if proper skill and capital was applied in that neighbourhood, abundance of good iron would be procured. At present, I take the revenue raised from Khetasree (open to correction) at 2800 rupees per annum, which is levied at the rate of three rupees per furnace; and, supposing each furnace to require four persons, there would then be 3700 persons employed in raising and smelting iron. Now, among them all, there is no contrivance to lessen human labour—no hammer mill—no other bellows but the air bags made of raw hides—no ore, or fuel, but what is fetched from the mountain on their own backs—and yet they live. What, then, might be done, if the immense water power of the Ramgunga River was applied to blasting, rolling, and hammering? But, say some, how is the iron to be transported into the plains; for, at present, there is no other mode of transit than on men's backs, four days' journey to Chilkee? I think there will be no great difficulty in making carriage roads down by the Ramgunga, until it enters the Gogher range; a depot should be made there, and I think an embankment might be built where the river leaves the mountains, sufficiently high to dam the water back to the depot, and make the river navigable through the gut. The iron might then be landed at the top of the embankment, and let down an incline to the river below, and floated from thence in barges to Gourmucktesur Ghaut. The same road would answer for all communication with the Terai forest, from which supplies of charcoal may be had as return carriage, and this would prevent the Lobha and Chandpoor hills from being exhausted. But why not have a smelting establishment near the Terai? because it is unhealthy; and yet, perhaps, some locality may be found, having water power at command, endless roads, &c., to which all the mines in Kemoon may transport their ores, to be smelted together to advantage; but I think the Indian Government should do something by way of making a beginning, if it was but to erect a single hammer mill in the Khetasree valley; for, as yet, the poor benighted of that region have no idea of an overshot wheel (of their mill wheels, churns, I may some day give you a description), or centrifugal fan. Hoping some more able pen may take up the subject, I remain, Sir, yours, &c., AN AGREE.

Liverpool, Feb. 5.

GEOLOGY AND MINERAL RESOURCES OF NEW BRUNSWICK.

SIR,—In reply to "A Mining Capitalist," who inquires concerning the facilities afforded for intercourse between Bathurst, New Brunswick, and other parts, I have hastily thrown together the following facts.

From Bathurst to Chatham, Miramichi, the distance, by the direct road, is 48 miles. From Chatham to the city of St. John, there are two great routes—one running through Kishibouguac, Richibucto, Buctouche, Cocagne, Shediac, The Bend, Sussex, Norton, and Hampton; the other, via the city of Fredericton, which is the diocesan head, and provincial seat of Government. The route, first described, which is all the way by land, with the exception of two ferries, is 200 miles. The other is 108 miles to Fredericton by land, and thence through the Nerepis Road, or else down the River St. John, by one of the regular steamers. The river distance is 90 miles—that by the Nerepis Road, considerably shorter. The tourist will find very fair carriage roads, and frequent bursts of picturesque scenery.

Between Bathurst, St. John, Halifax, and Quebec, there are regular mail interchanges weekly, with vehicles for the transmission of travellers. The principal towns, along the Miramichi River, in the neighbouring county of Northumberland, are Chatham, Douglas-Town, and Newcastle,—either of which, with a tolerable horse, may be reached from Bathurst in eight or 10 hours. At each of those places, is carried on a very extensive traffic, and a number of shipping annually loaded.

There is another land route, from Bathurst to Miramichi, around the coast, through Caraquet, Restigouche, the neighbouring county to the north, is also a sphere of active commercial enterprise. Dalhousie, its shire town, is 50 miles from Bathurst; Campbell-Town is 14 miles further. Both lie on the south-side of Restigouche River. There is a fine carriage road through a beautiful country. The town of New Carlisle, in Canada East, is nearly opposite the Capes at New Bandon,—and may be seen, in clear weather, from the coal-field before described. The distance across Chaleur Bay is about 25 miles. The passage is generally made in small open boats. The bay is enlivened by spring and fall merchant huts, by occasional vessels employed in the summer trade, and by innumerable fishing-smacks. The inhabitants are in the regular receipt of the mails from England, monthly in winter, semi-monthly in the summer season. There is also a steamer running between Chatham, Prince Edward Island, and Pictou, Nova Scotia. The carriage road from Bathurst through Restigouche and The Metis, to Quebec, is now completed. It may very easily be travelled in the course of five or six days.

La Baie des Chaleurs (the Bay of Heats), so called, we presume, from its powerful refraction of the solar rays, is a large gulf, or Mediterranean Sea, that with the Restigouche River at its head, divides between New Brunswick and Eastern Canada. Its entrance, which is 22 miles wide, is formed by Point Miscou on the south, and Point Macarell on the north—in latitude 47 deg. 58 sec. north, and longitude 64 deg. 30 sec. west. The bay is nearly 90 miles long, varying in width from 16 to 30 miles. Its original name, in the Micmac tongue, was *Eh-e-taan Ne-mua-ki*—literally, the sea of fish. It may be regarded as one immense harbour, containing several capacious ports. *La Baie des Chaleurs* was discovered by Cartier in 1534.

Restigouche is also an Indian name, signifying, the big river. This noble volume of water takes its rise near the *Tamiasquatic*, an extensive and romantically beautiful lake, supplying the *Madawaska*. After describing a general course of east-north-east for 230 miles, it rolls, through a spacious and excellent harbour, into the head of Chaleur Bay. Its entrance, two miles below Dalhousie, is wide, bold, unincumbered, and accessible in all weathers. There are several valuable islands in this river. As to the certainty of the existence of valuable mines in Gloucester, there can be no doubt. What I have personally seen, and examined, I must believe.

London, Feb. 2.

W. M. LEGGETT.

P.S.—*Miramichi* (literally, the happy retreat) is a noble river also. It rises in a lake, not far from the *Tobique*, is about 220 miles long, has an easterly bearing, and discharges, through a splendid bay, into the gulph of St. Lawrence, in latitude 47 deg. 5 min. north, longitude 64 deg. 53 min. west. Its shores are thickly settled for more than 100 miles from the Gulf Coast.

GREENHOW'S GEOMETRICAL RAILWAY.

SIR,—Many persons who have called on me to see the models of the geometrical railway, inquire, what objections I have to the present way in which railways are constructed?—apparently quite satisfied themselves that the system is perfect. In order to give an answer to the question, once for all, I beg to trouble you with the following remarks. The present system of the flat rail, on which the wheel has to run, protected from lateral displacement by a flange on the inner margin of the tyre, is a most crude and imperfect piece of mechanism—there being no adaptation between them; indeed, it is precisely what man, in his crudest state, would have had recourse to, had he wished to produce the same results.

Seeing that the wheels ran better on a hard smooth surface, he would have provided one of that nature, placed so as to take them in the direction he wished to go; when, finding they were apt to get off the road he had made for them, he would look for a means to prevent their doing so, and the addition of a flange would be the first to present itself to his imagination; and thus it has remained since the first use of railways by the colliery owners of the north, without any improvement being attempted on the original mode of applying the wheel to the rail—all resting apparently satisfied with, or ignorant of, the total unfitness of the provision for the purpose intended. The very nature of the application prevents its being properly fitted to answer the end proposed, because the perpendicular action of the flange upon the side of the rails obliges them to leave a considerable space (at least one inch) on each side, between the inner edge of the rails and the flanges of the wheels;—thus allowing a constant deviation from the direct line, to that extent, to either side, as the tendencies of the centrifugal force may incline—causing an uncertain, and never rightly adjusted, action of the whole machine, and rendering it decidedly unsafe to increase the speed beyond a very moderate limit. As the wheel revolves, the extreme edge of the flange, or rim, on the margin on the tyre, in resisting an attempt at lateral motion, comes in sharp contact with the side of the rail, causing a great amount of friction, cutting and destroying it by the grinding constantly going on as it rasps along the edge; also, at the same time, greatly endangering the safe passage of the carriage, from the disturbance given to its proper balance, on account of the oscillation caused by this violent friction. When the speed is great, this vehement action makes the wheel rebound from the rail, causing the one opposite to strike against the rail on the other side with great force; the carriage actually leaping with the concussion, until the equilibrium is so entirely destroyed, that at length it is thrown over—this all caused by the adaptation of the wheel and the rail being so imperfect.

Another great objection to the flat rail is, that, should any accident or contingency occur to raise up, or to depress one side, from its horizontal position in reference to the other, the wheel then would not run on the flat part of the tyre; but the extreme edge of the lower wheel would be the only part of it in contact—raising the flange to such an angle with the side of the rail, that its resistance would not be sufficient to restrain the carriage from running off the line. The same thing I have just described, occurs when in very rapid motion—one side becomes elevated by the diversion given to the centrifugal force, by the rebound from rail to rail, causing the oscillation before described.

Another great objection I have to the present system is, that in giving life (I had almost said, at any rate, the power of locomotion to the mighty machine, which is one of the greatest attributes of vitality), it has never been thought necessary to give it, at the same time, some more of the concomitant appendages of existence, and which in nature we always see accompany the power of locomotion—that is, the faculty of so adjusting its parts during movement, that it may be able, at all times, and in all contingencies, to preserve its true centre of gravity, withdrawing weight from, or adding it to, either side, as it may be required to retain its equilibrium. We will find every animal that moves, from the huge, unwieldy elephant to the diminutive mouse, have the power of adjusting their parts, so as to preserve the right balance under all circumstances; and had they not this faculty, they would not be able to go at any speed, nor would they ever be safe from accident. Tie a man's hands behind him, and then set him to run quickly, what would be the result?—he would fall before he got many yards; and why? because he was deprived of the power of preserving his balance. I, therefore, argue that, in giving the power of locomotion, we should also give the power of resisting the influences, and retaining the proper balance of the forces called into action by that motion. Yet another objection, and I am done for the present: it is, that sufficient care is not taken to arrange the dimensions of the carriages intended for this rapid motion, so as to make all parts equally press forward; distributing the weight uniformly round one centre, in order to avoid giving an undue preponderance to either of the forces, and thus prevent the violent oscillations which make railway travelling so unpleasant, and, at the same time, so precarious. There is no doubt, that by taking the distance between the rails as the basis, the proper dimensions and relative proportions of the carriages might be very easily ascertained. I would, before I close my remarks, call attention to the very dangerous practice of placing luggage on the tops of the carriages, thus greatly increasing the danger to be apprehended from the tendencies of the centrifugal force, and which the Legislature ought at once to put a stop to. I shall now conclude, without at all referring to the manner in which the geometrical railway obviates the above objections, and provides for the safety of the public.—C. H. GREENHOW: *Cecil-street, Strand*, Feb. 10.

METALLIC PRECIPITATIONS INFLUENCED BY MAGNETISM.

SIR,—Mr. R. Hunt, of Falmouth, who has so well distinguished himself in photographic researches, has lately instanced an experiment, which seems to prove, that metallic precipitation is influenced by the magnetic currents—a globe of mercury, in a glass dish, is placed over the poles of a magnet, the mercury being midway; the dish being supplied with a solution of nitrate of silver, it is found that the arborescent precipitate of silver exhibits a tendency to ramify in the direction of the magnetic curves formed by the currents of magnetism. I must assume, that I was the first individual who ever made experiments of this description. These experiments were, at the time, communicated to the late eminent traveller, Dr. E. D. Clarke, of Cambridge, and, by him, made known to Dr. Ure. Both magnetic bars, and those of a horse-shoe form, were introduced into solutions of nitrate of silver and bichloride of mercury; and the silver crystalline lamina in the former, and the mercurial globules in the latter, were invariably found to be most abundant at the edges and angles of the magnet, and that in the ratio of the relative magnetic power, and with a visible curvature in the direction of the magnetic currents.—J. MURRAY.

Portland-place, Hull, Jan. 29.

LEAVENED BREAD.

SIR,—Another patent, I believe, has been taken out, in the substitution of TARTARIC for hydrochloric acid, in the new process—here, it is quite true, we evade the risk of being poisoned by arsenic; but the question, as to the flour being unsound and unwholesome, or otherwise, remains precisely as it was. Besides all this, I am not quite sure that our health is entirely compatible with such a condiment as tartaric acid of soda, the continuous necessity of our "daily bread."

Portland-place, Hull, Feb. 2.

NEW SAFETY VALVE.—Mr. Martin, of Penzance, has forwarded us an idea for a new safety valve for the steam-engine, which we certainly think worthy of notice. The present lever valve, as he justly observes, with the occasional impediments to its free action, is doubtless the cause of some of the many accidents, and much of the loss of life resultant on explosions. Our correspondent proposes that the valve should be merely a circular disc, connected to a vertical rod, and resting upon a tube rising from the boiler, the rod to be weighted to the pressure required, the sockets through which this rod must work to be supported by arms riveted to the boiler. In this case there would be no fear of electric action, or of the valve getting fast in its seat; the only casualty in such a valve would be over-weighting, he proposes that to prevent unnecessary meddling, the whole should be covered with a case full of holes.

NEW STEAM PROPELLER.—There is to be seen at Messrs. Willmer and Smith's, Church-street, Liverpool, the model of a new propeller for steamers. We understand that it is the invention of a gentleman who has been for the last twenty years engaged in the water-wheel power machinery. It is believed that this invention will possess great advantages over everything now in use; amongst which it is stated that, by the application of these propellers, the immense weight of engines and fixtures now used will not be required. The steam-power may be applied with two or three small engines of from thirty to forty horse-power each, lying between decks or over the boilers; consequently, there would be a corresponding reduction in the consumption and cost of coal; and the space which the large engines now occupy could be appropriated for freight or passenger berths. This invention supercedes entirely the paddle-box, &c., and, it is believed, will effect a great increase of speed.—*Liverpool Advertiser*.

LATEST CURRENT PRICES OF METALS
LONDON, FEBRUARY 15, 1915.

LATEST CURRENT PRICES OF METALS.									
LONDON, FEBRUARY 15, 1885.									
	£	s.	d.	p.		£	s.	d.	p.
IRON—Barre, Wales, ton	0	0	0	0	COPPER—Ordin. sheet, lb.	0	0	0	10
" London " " "	9	15	10	0	" bottoms " " "	0	0	0	11
Nail rods " " " "	10	10	10	0	TIN—Com. block, cwt.	0	0	0	0
Hoop (Star), " " "	11	10	12	0	" bars " " "	0	0	0	1
Sheet " " " "	12	10	13	0	Refined " " "	0	0	0	0
Bars " " " "	0	0	11	0	Strains " " "	0	0	4	0
Welsh cold-chast	0	0	—	0	Banca " " "	0	0	4	10
foundry pig " " "	3	0	5	15	TIN PLATES—Ch. " IX	1	19	2	0
Scotch pig, Clyde	0	0	4	0	Coke, IC " " "	0	0	1	8
Rails " " " "	0	0	11	15	" IX " " "	0	0	1	14
Russian, CCND c.	0	0	—	0	LEAD—Sheet, lb. " 20	5	20	10	0
" PSI " " "	0	0	—	0	Pig, refined " " "	0	0	21	10
" Groniff " " "	0	0	14	10	" common " " "	0	0	19	10
" Archangel " " "	0	0	13	12	" Spanish, in bd. " 19	15	19	0	0
Swedish d. on the spot	11	10	11	15	" Banca " " "	0	0	17	15
" Steel, Regt. " " "	15	0	10	0	SPELTEN (Coke), " " "	0	0	20	0
" " " " "	15	0	15	0	ZINC—(Sheet) in export,*	0	0	30	0
COPPER—Tile, " " "	0	0	92	0	QUICKSILVER a ton " " "	0	0	0	4
Tough cake " " "	0	0	93	0	REFINED METAL " " "	0	0	—	0
Best selected " " "	0	0	96	0					

(From our Correspondent.)

IRON.—Prices of Welsh and Staffordshire maintained, but business limited. Some sales this week of Scotch pig at our quotation for exportation. In Russian and Swedish, no transactions.

COPPER maintains quotations, but demand has much fallen off.
TIN.—English is in fair demand, and foreign is firm; at a public sale to-day of 281 slabs Straits, 176 slabs sold at 87s., and the rest at 85s. 6d. to 87s. 6d.
TIN PLATES, dull, with little doing in either description.
LEAD continues very firm, and a further rise is not unlikely.
SPELTER.—No sales this week of any consequence, and the market looks flat.

Communicated by Messrs. Whitecomb and Barton, Old Broad-street.
English iron continues very firm at quotations. In Scotch pig-iron but little business has been done during the week, price may be quoted at 82s. 6d. net cash, and 85s. for time. Foreign iron steady. Foreign steel, dull of sale. English copper in good demand; as also English lead—for the latter higher prices are expected. At public sale, this day, 282 slabs Straits tin were sold at 85s. 6d. to 88s. 6d. Tin plates flat. A small sale of spelter is reported at 30s. on the spot.

Feb. 6.—We had expected ere this to have noted an improvement in the money market, which is regulating the price of this commodity; no improvement, however, has taken place, and, consequently, prices continue to recede. Yesterday two lots were disposed of at 78s. and 77s. 6d.; and to-day we heard of a sale of 700 tons at 76s. We quote the price 78s.—dull market.—*National Advertiser*.

Feb. 10.—Since the above report was written, but little alteration has taken place.—On Monday a large business was done, say 3000 tons sold at 77s. and 78s. To-day several parcels were offered at 78s., but no buyers above 77s., a lot of 50 tons was sold at 76s. for immediate cash. To give an idea of the money market, as much as 86s., 3 months, has at the same time been paid for iron. We quote the price 77s. 6d. prompt cash.—*National.*

Feb. 11.—We still quote the price of Scotch pigs here at 80s., and at this rate several sales have been made. The market is steady, with a fair demand.—*P. & H. FERGUSON.*

LONDON, FEBRUARY 12, 1945.

RAILWAYS.	Paid	Outstanding at last year.	Outstanding at last year.
Aberdeen	25	101	101
Armagh, Coleraine, and Portlough—250 shares	19	—	10
Birmingham and Gloucester—1000 shares	100	132	129
Ditto New issue, 74 dit.—250 shares	174	32	32
Birmingham and Oxford Junction—200 shares	2	24	24
Bristol and Exeter—1000 shares	70	89	89
Ditto New—334 shares	2	12	12
Bristol and Gloucester—500 per share	30	56	56
Ditto Extension—500 shares	5	18	18
Cambridge and Lincoln—250 shares	24	24	24
Ditto New—250 shares	12	—	—
Chelmsford and Bury	14	—	—
Chester and Holyhead—500 shares	15	214	224
Chichester and Brighton	20	—	—
Clydesdale Junction	5	—	—
Cork and Killarney—500 shares	24	—	—
Cork and Waterford—250 shares	1	—	—
Coventry, Nuneaton, Birmingham, and Leicester—250 sh.	1	—	—
Cornwall—500 shares	5	44	44
Derby, Uttoxeter, and Stafford	2	5	5
Direct Northern—500 shares	24	26	26
Direct Manchester (Rensington's)—200 shares	21	14	14
Ditto Rastrick's	51	3	3
Dublin and Belfast Junction—500 shares	10	64	64
Dublin, Belfast, and Coleraine—500 shares	24	10	10
Dublin and Galway—500 shares	4	4	4
Dundalk and Enniskillen—500 shares	2	—	—
Eastern Counties—250 shares	24	22	22
East Dereham and Norwich	14	160	224
East Lincolnshire	14	22	22
Edinburgh and Glasgow—500 shares	50	764	794
Edinburgh and Northern—250 shares	14	—	—
Edinburgh and Perth	14	3	3
Exeter, Yeovil, and Dorchester—500 shares	2	20	24
Gloucester, Aberystwith, and Central Wales—250 shares	18	34	34
Goole and Doncaster—200 shares	42	12	12
Grand Junction—1000 shares	100	—	—
Ditto 4 shares—500 shares	174	—	—
Ditto 4 shares—250 shares	—	—	—
Ditto 400 shares, Liverpool to Manchester	4	—	—
Grand Union (Nottingham and Lynn)	1	14	14
Great Grimaby and Sheffield—500 shares	5	—	—
Great Southern and Western (Ireland)—500 shares	15	22	214
Ditto Extension—500 shares	124	—	184
Great North of England—1000 shares	100	216	218
Ditto New—400 shares	5	—	62
Great North of Scotland—500 shares	5	—	—
Great Western—1000 shares	40	169	165
Ditto 4 shares—500 shares	50	934	91
Ditto Fifth—200 shares	20	374	36
Guildford, Farnham, and Portsmouth—500 shares	5	54	56
Harwich—200 shares	1	—	—
Hull and Gainsborough—250 shares	10	—	—
Hull and Selby—500 shares	50	108	108
Inverness and Elgin—200 shares	1	—	—
Irish North Midland	14	—	—
Kendal and Windermere—250 shares	1	—	—
Lancaster and Carlisle—500 shares	23	664	67
Leeds and Bradford—500 shares	15	—	—
Leeds and West Riding Junction	12	—	—
Leicester and Birmingham—300 shares	22	—	dis.
Leicester and Bedford—300 shares	22	14 2	dis.
Leicester and Tamworth—300 shares	42	—	dis.
Liverpool and Leeds Direct—500 shares	24	14	14
Liverpool, Manchester, and Newcastle Junction	12	24	3
London and Birmingham—500 shares	229	229	229
London and Birmingham Extension—250 shares	—	—	—
London and Blackwall	Av. 167 134 4d	4	01
London and Brighton—500 shares	50	69	674
London and Croydon	Av. 137 154 9d	224	224
London and Greenwich	Av. 127 154 4d	10	—
London and South Western	Av. 417 6s 10d	80	80
London and York—500 shares	24	3	44
London and Windsor—500 shares	1	2	—
London, Warwick, and Kidderminster—500 shares	2	2	14
London, Salisbury, and Yeovil—500 shares	24	24	—
Londonderry and Coleraine—500 shares	24	24	58
Londonderry and Enniskillen—300 shares	5	7	3
Lynn and Ely—250 shares	5	62	64
Lynn and Dereham—250 shares	5	54	—
Manchester and Leeds—1000 shares	62	136	136
Manchester and Birmingham—400 shares	40	784	784
Ditto 4 shares—100 shares	19	12	12
Manchester, Buxton, and Matlock—200 shares	42	—	14
Manchester and Southampton	2	24	24
Midland	Stock	152	152
Ditto Birmingham and Derby	Stock	123	122
Midland Great Western (Irish)—500 shares	24	9	—
Ditto Extension to Sligo	24	—	—
Newcastle and Berwick—250 shares	10	234	224
Newcastle and Carlisle—1000 shares	100	—	—
Newcastle and Darlington Junction—250 shares	20	47	46
Ditto New (Branding)—250 shares	20	414	40
Newport and Aberystwith	24	—	—
Newry and Enniskillen—500 shares	24	—	—
Newark, Sheffield, and Boston—250 shares	21	24	—
North British—250 shares	174	254	254
North Devon	2	—	14
Northern and Eastern—500 shares	45	71	—
North Kent and Direct Dover—500 shares	24	34	—
North Staffordshire—250 shares	34	34	34
North Wales—250 shares	34	34	34
Norwich and Brandon—500 shares	18	26	26
Nottingham, Banbury, and Cheltenham	2	24	14
Nottingham and Boston—200 shares	16	—	—
Nottingham, Erewash Valley, and Manchester	16	—	—
Oxford, Worcester, and Wolverhampton	19	154	16
Oxford, Gosport, Portsmouth, and Southampton—200 shares	42	—	—
Portsmouth Direct—500 shares	34	44	44
Preston and Warrington—500 shares	5	17	35
Richmond—200 shares	5	17	17
Rugby and Huntingdon—200 shares	2	14	14
Scottish Central—250 shares	74	154	16
Scottish Midland—250 shares	5	6	—
Sheffield and Lincoln—250 shares	14	—	—
Sheffield and Manchester—1000 shares	100	—	—
Shrewsbury, Wolverhampton, Dudley, & Birm.—500 shares	24	—	—
Shrewsbury, Hereford, and North Wales	24	—	—
Shrewsbury and Birmingham	24	34	34
Somersetshire Midland	24	—	14
South Devon—500 shares	25	374	37
South Eastern and Dover	Av. 33 2d 4d	394	394
South Midland—200 shares	42	24	24
South Wales—500 shares	24	61	61
Staffordshire and Shropshire—500 shares	24	—	—
Staines and Richmond—200 shares	1	24	24
Stretton Valley	3	24	24
Trent Valley and Holyhead Junction—200 shares	2	24	24
Warwick and Cheltenham—200 shares	14	—	—
Waterford and Kilkenny—200 shares	3	2	2
Welsh Midland	24	2	2
Wexford and Carlow	24	—	—
Wills, Somerset, and Weymouth—500 shares	19	34	34
Worcester, Shrewsbury, and Crewe Union	19	—	—
Yarmouth and Norwich—500 shares	20	38	374
York and Carlisle	24	—	—
York and North Midland—500 shares	50	1034	1034
Ditto Scarborough Branch—250 shares	25	49	49
Ditto Selby—200 shares	25	78	78
Ditto Extension—250 shares	15	34	34

FOREIGN RAILWAYS

Bordeaux and Aniens—200 shares	10	12	19
Bordeaux and Toulouse and Cette (MacKenzie)—200 shares	2	2	21
Bordeaux, Toulouse, and Cette (Esposito)—200 shares	2	2	21
Central of Spain—200 shares	2	2	21
Dendre Valley—200 shares	2	2	21
Dijon and Mulhouse—200 shares	2	2	21
Dutch Rhénish—200 shares	2	2	21
East Indian	1	1	1
Great Northern of France (constituted)	6	10	10
Great Paris and Lyons—200 shares	1	1	1
Hannan and South Midland Junction—200 shares	1	1	1
Harbour North Midland	1	1	1
Jersey	1	1	1
Louvain and Jemeppe—200 shares	2	2	2
Lyons and Avignon—200 shares	2	2	2
Luxembourg	4	4	4
Namur and Liège—200 shares	2	2	2
Oreans and Vierzon—200 shares	10	17	17
Orleans and Bordeaux—200 shares	4	4	4
Paris and Lyons (Lafitte)—200 shares	2	2	2
Paris and Lyons (Lafitte)—200 shares	2	2	2
Paris and Lyons (Garnier)—200 shares	2	2	2
Paris and Lyons (Calon's)—200 shares	2	2	2
Paris and Strasbourg (Garnier's)—200 shares	2	2	2
Ditto (Comp. de F&E)	2	2	2
Paris (St. Quentin)	2	2	2
Paris and Ayrault—200 per share	2	2	2
Paris—200 shares	10	40	40
Paris and Rouen—200 shares	2	2	2
Royal North of Spain—200 shares	2	2	2
Rouen and Havre—200 shares	10	30	30
Sambre and Meuse—200 shares	2	2	2
Strasbourg and Bâle—14 shares	14	10	10
Tours and Nantes (MacKenzie)—200 shares	4	4	4
Ditto (Lebevre)—200 per share	2	2	2
Venice and Ancona (Italian and Austrian)	2	2	2
West Flanders	2	2	2

A NOBLE DUKE AND HOLLOWAY'S PILL.—Professor Holloway has lately been honoured by the personal thanks of one of the most renowned dukes of the realm, who (like the Earl of Aldborough) has been cured of a liver and stomach complaint of some years' standing, attendant with great weakness and debility, by means of Holloway's celebrated pills; and this illustrious physician has also been tried in vain. Dropsy, paralysis, and diseases of the lungs, have nearly all their origin in the disordered action of the bowels, which a few timely drops of Holloway's pills will cure. Sold by all druggists and in medicine; and at Professor Holloway's Establishment, 344, Strand, London, W.C.

PRICES OF MINING SHARES.

BRITISH MINES.	Company.	Price.
235 Andrew & Nangle's	25 1/2	60
100 Bedford	30	24 1/2
4000 Birch Tor Tin Mine	10 1/2	12
250 Blackmore	10 1/2	300
300 Botolph	10 1/2	40
120 Brewer	10 1/2	24
10000 British Iron, New Regia	10 1/2	24 1/2
10000 Ditto ditto, scrip	10 1/2	30
120 Budick Consols	10 1/2	200
400 Bwch Gwmerin	10 1/2	200
10000 Callington	10 1/2	40
250 Caradon Consols	10 1/2	60
250 Caradon Copper Mine	10 1/2	36
250 Caradon Mines	10 1/2	30
250 Caradon United	10 1/2	9
250 Caradon Wh. Hooper	10 1/2	130
10000 Carn Bra	10 1/2	240
114 Charlesworth	10 1/2	55
250 Chyppaz	10 1/2	51 1/2
19000 Combarn	10 1/2	30
12000 Comfort	10 1/2	14
12000 Con. Trellis Mining Ass.	10 1/2	17 1/2
12000 Condarrow	10 1/2	8
2500 Cook's Kitchen	10 1/2	5
10000 Copper Bottom	10 1/2	11
3200 Cornubian Lead Co.	10 1/2	70
240 Cornubian Moor	10 1/2	120
12000 Crag Brava	10 1/2	200
12000 Cooheen	10 1/2	20
10000 Devon & Courtney Con.	10 1/2	3
10000 Dhurol	10 1/2	80
186 Dulcoath	10 1/2	45
10000 Durham County Coal	10 1/2	5
12000 East Pool	10 1/2	34
9000 East Tamar Consols	10 1/2	1
250 East Wheel Alfred	10 1/2	150
250 East Wheel Croft	10 1/2	1500
12000 East Wheel Rose	10 1/2	14
12000 East Wheel Seta	10 1/2	80
512 Fowey Consols	10 1/2	10
50000 Galvanised Iron Co.	10 1/2	35
10000 Godolphin	10 1/2	130
250 Gonauna	10 1/2	200
12000 Gower	10 1/2	40
244 Granbler & St. Aubyn	10 1/2	400
10000 Great Consols	10 1/2	11
250 Great Calstock Moors	10 1/2	4
250 Great Mitchell Consols	10 1/2	20
10000 Grogwinlon	10 1/2	13
10000 Gurnis	10 1/2	50
12000 Hallenbough	10 1/2	5
10000 Harrowbarrow Old Mine	10 1/2	24
10000 Hawkmoor	10 1/2	6
6000 Helston Down Con.	10 1/2	15
250 Herodfoot	10 1/2	124 1/2
10000 Hilberish	10 1/2	26
10000 Holmbush	10 1/2	14
250 Iry Tor	10 1/2	14
12000 Kirkcubrightshire	10 1/2	15
12000 Lamerhoe Wh. Maria	10 1/2	10
2045 Lamerhoe & Penstrathal	10 1/2	150
12000 Larkholes	10 1/2	150
10000 Levan	10 1/2	6
10000 Lewis	10 1/2	3
12000 Ludcott	10 1/2	42
28000 Marke Valley	10 1/2	124
10000 Mining Co. of Ireland	10 1/2	2
10000 Nant-Ar-Nelle	10 1/2	20
200 Nantarrow Consols	10 1/2	104
200 North Fowey Consols	10 1/2	10
12000 North Holmbush	10 1/2	37
10000 North Pool	10 1/2	104
700 North Rose	10 1/2	600
250 North Trebuge	10 1/2	41
10000 North Wh. Providence	10 1/2	24
12000 North Wheel Rose	10 1/2	224
12000 Northern Coal Co.	10 1/2	23
10000 Old Delabole Slate Co.	10 1/2	25
12000 Par Consols	10 1/2	500
250 Penallth Moor	10 1/2	30
10000 Penrhyn	10 1/2	65
512 Pen-y-Castell Wh. Yeoland	10 1/2	34
10000 Rhymney Iron	10 1/2	38 1/2
10000 Rose Consols	10 1/2	10
250 Rosewell Hill	10 1/2	24
10000 Roscarrock	10 1/2	2
25000 Roscarvalley	10 1/2	5
12000 Saurton Consols	10 1/2	450
12000 South Caradon	10 1/2	94 1/2
200 South St. George	10 1/2	14
200 South Towan	10 1/2	10
12000 South Trellis	10 1/2	15
12000 South Trellis	10 1/2	154
12000 South Trellis	10 1/2	220
12000 South Trellis	10 1/2	60
12000 South Trellis	10 1/2	24
1034 South Wh. Maria	10 1/2	2
250 South Wheel Rose	10 1/2	30
250 St. Austell Consols	10 1/2	6

RAILWAY TRAFFIC RETURNS.

Name of Railway.	Length.	Present actual.	Last Div.	Traffic Returns.	1845
Arbroath and Forfar	15	£140,792	24	£160 0 0	£196
Chester and Birkenhead	15	331,540	24	512 6 9	580
Dublin and Kingstown	32	349,736	9	706 4 5	588
Dundee and Arbroath	17	153,598	4	242 4 5	229
Durham and Sunderland	10	302,118	2	633 7 8	569
E. Counties & North & East	124 1/2	4,090,328	6	2641 12 2	2072
Edinburgh and Glasgow	46	1,686,226	6	1656 9 4	633
Glasgow, Paisley, & Greenock	51	1,104,773	2	667 16 3	711
Glasgow, Paisley, & Greenock	23	8,064,773	10	141 16 2	1577
Grand Junction Company	58	85,001	5	1647 11 4	14010
Graveland and Rochester	45	1,295,196	8	657 18 3	1088
Great North of England	220	7,717,043	10	733 18 8	910
Great Western	176	6,997,065	10	1061 17 11	4941
Hartlepool	4	1,078,151	4	1061 17 11	4941
London and Birmingham	56	2,658,572	34	1061 17 11	4941
London and Blackwall	10	2,620,724	9	1061 17 11	4941
London and Croydon	53	1,959,062	8	1061 17 11	4941
London and South-Western	31	3,972,609	8	1061 17 11	4941
Manchester and Birmingham	10	805,968	8	1061 17 11	4941
Man. R. & L. & Leeds	179	6,284,631	5	1061 17 11	4941
Midland Company	61	1,137,385	8	1061 17 11	4941
Newcastle and Darlington	22 1/2	1,136,829	5	1061 17 11	4941
Newcastle and North Shields	7	316,869	5	1061 17 11	4941
Norfolk	32	1,060,551	62	1061 17 11	4941
North Union, Bolton & Co.	22	439,014	2	1061 17 11	4941
Breton and Wyre	19	1,312,225	24	1061 17 11	4941
Sheffield and Manchester	88	4,284,924	24	1061 17 11	4941
South-Eastern and Dover	30	611,073	3	1061 17 11	4941
Taff Vale	25	250,037	7	1061 17 11	4941
Ulster	204	1,379,991	10	1061 17 11	4941
Yarmouth and Norwich	83	2,082,916	8	1061 17 11	4941
York and North Midland	82	1,995,306	9	1061 17 11	4941
Paris and Rouen	84	1,995,306	9	1061 17 11	4941

* The traffic return of this company is now included in the London and Birmingham.

† Including the Grand Junction Company.

VENICE AND TRIESTE RAILWAY.—We regret that this project has fallen to the ground in this country, but we find its importance has not escaped the notice of the people of Venice—for a continuation of the Lombardo-Venetian line, through the Venetian States on to Laybach, is now contemplated, from which a short branch would communicate with Trieste. No deposits were ever paid to the projectors, nor were the shares ever allotted.

DUFFY'S LYNVI AND PORTHCAWL.—On the 4th inst. the special general meeting was held at Bridgend, for considering the reduction of tonnage on the line, and an application to any competing project. Sir D. MACKWORTH, Bart. was in the chair. The last annual dividend was stated to be 8 per cent. and it was proposed. The last annual dividend was stated to be 8 per cent. and it was proposed. The last annual dividend was stated to be 8 per cent. and it was proposed.

WELSH MIDLAND RAILWAY.—An influential meeting in support of this measure was held at the Town Hall, Swansea, on Thursday. It appeared that there was no foundation for the report of an amalgamation with the Swansea Vale Railway. The meeting was numerously attended, and a resolution in support of the measure carried unanimously.

THAMES TUNNEL COMPANY.—The number of passengers who passed through the Tunnel in the week ending Feb. 7, was 21,256; amount of money, £28 11s. 4d. (Last year, 100,100 10s. 1d.)

The controversy that now exists in the south of France on the subject of the monopoly of the Union Company of the Coal Mine Proprietors of the Loire, St. Etienne, and Rive-de-Gier, has been noticed in several former Numbers of this Journal, and we have invariably supported the just claims of the mining community, and we have invariably supported the just claims of the mining community, and we have invariably supported the just claims of the mining community.

BYRMO IRON-WORKS—INJUNCTION.—In the Vice-Chancellor's Court, yesterday, in the case, "Lushman v. Roy and others," an injunction was obtained, restraining the defendants from any interference in the management of the Byrmo Iron-Works, S.W.; the defendants having been directors of the company, to whom the works belonged, but who had been removed from office. The affidavits were of considerable length.

MINING COMPANY OF IRELAND—COMBINATION.—Our readers will recollect from a statement made in the directors report, presented at their late meeting, that at the close of the year they were compelled to shut up the Earl's-hill mine, in the county of Tipperary, in consequence of attempts being made to murder their manager, and other violent acts which were traced to the miners. This proceeding, although attended with some loss to the company, is we are glad to find, likely to prove of infinite service to all parties concerned. Some hundreds of the people were reduced from a state of comparative comfort to utter destitution; but still the perpetrators of the outrages were again set at work, and the old hands re-employed, no cause of complaint should be given; and the old hands re-employed, no cause of complaint should be given; and the old hands re-employed, no cause of complaint should be given.

RAILWAY TRAFFIC is increasing rapidly, as for the last month of the present quarter 457,600¹/₂ has been received, being an increase over the corresponding period of 1845 of 64,843¹/₂. The amount of traffic for the last week on nearly 1800 miles was 117,103¹/₂—viz., 56,840¹/₂ for the conveyance of passengers only; 28,800¹/₂ for the carriage of goods; and a remainder of 31,463¹/₂ for passengers and goods together, not respectively accounted for. We understand that the new Postmaster-General, the Earl of St. Germans, has accepted the liberal offer of the Brighton Company to carry a bag of letters by every train gratis. The South-Eastern Company directors have made the same proposal, which, no doubt, will also be accepted. These offers on the part of railway companies are highly honourable, and, no doubt, will be duly appreciated by the public.

MINING OFFICES, 16, CORNHILL.—Mr. R. TREDINNICK (of Cornhill) having established PRACTICAL AGENTS and CORRESPONDENTS in every MINING DISTRICT, whereby he obtains early and accurate information respecting MINES, and offers his services to capitalists and adventurers in the PURCHASE and DISPOSAL of SHARES. Mr. Tredinnick has business to do in the following MINES: North Pool, Andrew & Nangle's, Wheel Buckets, South Trellis, East Hill, Granbler & St. Aubyn, Herodfoot.

LAMERHOE WHEEL MARIA COPPER MINE.—ROSCARROCK SILVER-LEAD MINE. WHEEL MARIA SILVER AND COPPER MINE. WHEEL WALTER COPPER AND LEAD MINE. The BUSINESS of the ABOVE MINES is now CONDUCTED at No. 4, KING-STREET, CHEAPSIDE, where all information respecting them may be obtained. JAMES CROFTS, Secretary. Dated Feb. 14, 1846.

EUROPEAN GAS COMPANY.—Notice is hereby given, that a HALF-YEARLY MEETING of the proprietors will be HELD on Thursday, the 5th day of March next, at the hour of One o'clock in the afternoon precisely, at the office of the company, 39, Finsbury-circus, London. By order of the board, J. B. GREAVES.

COPPER ORES.

Sampled Jan. 28, and Sold at Andrew's Hotel, Redruth, Feb. 12, 1846.

Mines.	Tons.	Price.
Carn Brea	127	£4 13 6
ditto	111	5 1 0
ditto	94	3 15 6
ditto	72	10 0 6
ditto	70	10 18 0
ditto	54	8 13 0
ditto	31	3 4 6
ditto	2	60 0 0
Wh. Friendship	80	9 11 8
ditto	75	4 12 0
ditto	72	4 15 6
ditto	69	2 14 6
ditto	61	2 17 0
Wh. Friendship	80	5 0 6
ditto	14	1 10 0
Fowey Consols	111	4 18 6
ditto	109	3 1 6
ditto	102	5 7 6

TOTAL PRODUCE.

Carn Brea Mines 611 3919 19 0 Wheel Trellis 139 2793 14 0

Wh. Friendship 332 2604 4 6 Wheel Virgin 98 272 0 0

Fowey Consols 322 1427 7 6 Hayle Slag 43 338 12 6

United Hills 305 1193 11 6 Carn Perran 69 177 12 6

Wheel Sparrow 232 1691 17 0 Lamoio Consols 14 100 2 6

Trenow Consols 232 1691 17 0 Redruth Consols 14 100 2 6

Average standard, 108¹/₂—Average produce, 78¹/₂—Average price per ton, 52¹/₂ 4s. 6d.

Quantity of ore, 2901 tons—Quantity of fine copper, 124 tons 8 cwt.—Amount of money, 13,079¹/₂ 13s. 6d.—Average standard of last sale, 117¹/₂ 19s. 0d.—Average produce ditto, 78¹/₂.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Mines Royal 77 £282 19 6

English Copper 350 2198 1 6

Vivian and Sons 452 2302 2 0

Freemant and Co. 371 2263 12 0

Greenfield and Sons 360 235 18 0

Sims, Williams, and Co. 190 365 6 0

Williams, Foster, and Co. 604 3790 14 0

Total tons, 2901—Total amount, £36,018 15s. 6d.

COPPER ORES.

Sampled Jan. 21, and Sold at Seamen's, Feb. 11, 1846.

Mines.	Prod.	Stand.	Price.
Chill	58	45	£5 256 0 0
ditto	53	45	82 34 14 0
ditto	52	45	82 34 14 0
ditto	51	45	82 34 14 0
ditto	50	45	82 34 14 0
ditto	49	45	82 34 14 0
ditto	48	45	82 34 14 0
ditto	47	45	82 34 14 0
ditto	46	45	82 34 14 0
ditto	45	45	82 34 14 0
ditto	44	45	82 34 14 0
ditto	43	45	82 34 14 0
ditto	42	45	82 34 14 0
ditto	41	45	82 34 14 0
ditto	40	45	82 34 14 0

TOTAL PRODUCE.

Chill 513 41649 19 6 San Jose in Cobre 232 23720 6 0

Santiago 448 4754 2 0 Victoria 61 2337 16 0

Cremhuene 61 2337 16 0

Total tons, 1405—Total amount, £36,018 15s. 6d.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

English Copper Company 94 £3149 17 0

Freemant and Co. 120 2444 10 0

P. Greenfield and Sons 195 6684 8 0

Sims, Williams, North, Drace, and Co. 332 4928 14 0

Vivian and Sons 237 3268 17 0

Williams, Foster, and Co. 237 3268 17 0

Total tons, 1405—Total amount, £36,018 15s. 6d.

Copper ores for sale Feb. 25.—Cobre 108, ditto 96, ditto 90, ditto 84, ditto 78, ditto 72, ditto 66, ditto 60, ditto 54, ditto 48, ditto 42, ditto 36, ditto 30, ditto 24, ditto 18, ditto 12, ditto 6, ditto 0.

WHEAL SPARROW MINE.—We have received "An Observer's" rejoinder to Capt. Nance, respecting the system of management pursued at this mine; and, although at all times anxious to give publicity to communications having for their object the remedying of defects in the working of mines, a sense of fairness—after Captain Nance's prompt attention—will not permit the insertion of further letters, without the author's name being attached thereto.

"S. S. (Ives).—We are obliged for the communication; authorised corrections of our share list are at all times acceptable.

NATURAL HISTORY OF COAL.—The second of this excellent series of lectures will appear in our next.

"Morcarator."—We are obliged to our intelligent correspondent for his communication, who will perceive the value we attach to his information, from the use we have made of it.

The Glossary of Mining Terms is unavoidably postponed. We are at all times obliged for such information.

THE MINING JOURNAL

And Atmospheric Railway Gazette.

LONDON, FEBRUARY 14, 1846.

We would request the particular attention of our readers to the fact, that the MINING JOURNAL, when bound in volumes, forms a work of great utility for reference; and, to facilitate which advantage, a compendious Table of Contents is issued at the close of each year's publication. The Index for 1845 accompanied the last Journal of the year, published on the 27th December.

The letters published in our Journal, having exemplified the weed-

ing of the railway scrip market,

promote any object, which may have in view the protection and security of life of the working miner and collier.

In advertent to these measures, we have, however, for a moment, lost sight of the object more particularly before us, and to which we with melancholy, but still hopeful, feelings recur. In the present instance, we find that, after a protracted inquiry, witnesses and advocates were put forward (for not one soul of those employed in the fatal pit remain to tell the tale), whose only apparent object was to prove that the loss of life arose from accident *uncontrollable*,—and that, as the pit was found to be well ventilated at the time of investigation, it was to be presumed that such was the case when the accident occurred. To prove that such was the case, we have the evidence of those whose duty it was to have seen that there was a proper current of air in the workings, and who, to have given other evidence, would have been to damnify themselves. Again, we find Mr. DEAKIN, a valued correspondent of ours, called in, whose evidence is to the effect, that when he visited the pit, and the several headings, or points of working, the air was good, while he qualified his evidence by stating, that much—indeed all—must depend on the care observed; then, again, we have Mr. STRAUVE, who tells us that which we all know, and describes the range of air for ventilating collieries, by means of a downcast pit, and its ascending by an up-cast pit, with the application of a furnace underground, &c. We have also the evidence of one or two more on this point, all tending to show that, with due caution, accidents should seldom or ever arise; but in no way does this bear on the accident, it being merely to show that the "black vein" pit may, with ordinary care, be worked. Messrs. RUSSELL and Co., the owners, have thus attained their object; and this portion of the colliery may be resumed, free from any risk, if care be observed. The remarks of Mr. OWEN, we consider pertinent—if the coroner and the jury did not; and we regret that Sir THOMAS PHILLIPS should have been engaged in a cause, where the primary object was to preclude inquiry and investigation, in a matter which affected the lives of the collier community, and in which was involved the loss of life of 35 individuals. We cannot trust ourselves to say more; but refer to the evidence which appeared at length in the *Monmouthshire Merlin*. Our contemporary has taken much pains in acquiring information, and in drawing attention to the subject, and we feel assured, that it is only to refer to the accident, and the verdict, as given at length in the columns of that journal, to secure the ready support of all interested in mining pursuits, or embarked in colliery operations.

In last week's Journal, we gave a very long and interesting article on the progress of mining in South Australia: we have this week been favoured with various official returns, which have been presented to his excellency the Governor by the colonial authorities, relative to the general development now making so rapid an advancement in mining operations in this thriving colony, which we have great pleasure in laying before our readers. From the official return of exports, the produce of the colony, from 1838 to 1844, it appears that the first export of ores took place in 1841, being lead to the value of 390*l*. In 1843, 18 tons 13 cwt., ditto value 104*l*. 10*s*.; and in 1844, 203 tons, value 2427*l*. Copper was first exported in 1843, being only 1 ton 3 cwt., producing 23*l*.; but it has advanced so rapidly, that in 1844 they exported 277 tons, value 4009*l*. 10*s*.; but which has considerably increased,—as, in the first quarter of 1845, the export of copper was 403½ tons, value 6647*l*. 5*s*. 6*d*., and lead, 74 tons, value 777*l*. 8*s*. From the official return of the mines we find, that at the close of 1844, the following is the quantity and estimated value of the respective ores exported during the year:—

Ores.	Quantity.	Estimated Value.
Lead.....	203 tons	£2,327 0 0
Copper.....	277 "	4,009 10 0
Totals.....	480 tons	£6,436 10 0

There were four copper and four lead mines, in the province of South Australia—only six, however, of them are in active operation, three of copper and three of lead. Further discoveries have been made, during the last year, of rich copper lodes,—and, in one case, a section of 100 acres was sold by public auction for 220*l*. It has been found, in that district, that there is a continuous outcrop of copper ore clearly discernible, and generally averaging 18 feet in breadth; and where that lode terminated another commenced, traceable on the surface for upwards of 200 paces, and in breadth about 15 feet. Contrary to what is generally obtained in this country, where it is regarded as an unfavourable symptom for the metal to approach the surface of the ground, it has been found in South Australia that the deeper the lodes are traced the richer do they become. This is particularly the case with the Kapunda Mine, which was originally discovered in consequence of indications on the surface. Besides metals, another great resource to this colony is the production of salt—of which there was exported, in 1843, only 41 tons, value 137*l*.; in 1844, 130 tons, value 380*l*.; and during the first quarter of 1845, 880 cwt., value 103*l*. 10*s*. The manufacture of salt will be one of great importance, as there is daily becoming a greater and greater demand for it. The total imports consumed in the colony, entered at Port Adelaide for the first quarter of 1845, was 22,968*l*. 9*s*. 5*d*.; exports, the produce of the colony, 45,849*l*. 6*s*. 6*d*., being an excess of exports beyond imports of 22,880*l*. 17*s*. 1*d*. There are four machine manufactories, one brass and two iron foundries, one salt work, and 21 flour mills, in full work. One great advantage that Port Adelaide enjoys, and all the other harbours of the province, is that they are free to all nations. Whale ships, and all other vessels, may therefore now freely go in for refreshment, refit, traffic, or freights, and depart without one farthing of charge, in the shape of fiscal or official exactions—as his excellency the Governor has abolished all tonnage dues, pilotage rates, harbour dues, entrance and clearance, and wharfage dues, and even the Government fees, payable at the Custom-house. We are glad to see this colony thriving as it is, every successive year,—and no doubt, with the industry that is displayed by the colonists, not only in agricultural but mining enterprise, it will in a few years hence become one of the most flourishing, as it has been now fully ascertained that very rich ores abound in the country, and only require working to render a most lucrative return to the adventurers.

THE PRICE OF IRON IN FRANCE.—The current price of cast iron at the furnaces of the Upper Marne have been contracted for, to be delivered at Dijon from the 15th of June, 1846, to the 15th of June, at 8*l*. 10*s*. per ton, as follows:—1st, 600,000 lbs.; 2d, 100,000 lbs.; 3d, 600,000 lbs. The other furnaces of the valley of the Marne have entered into the following contracts:—First, 800,000 lbs. delivered at St. Dizier, at 7*l*. 18*s*.; second, 800,000 lbs. taken at the furnaces, at 7*l*. 18*s*.; and third, 100,000 lbs., at 8*l*. The latter contracts will be delivered in four or five months, commencing with the 1st of March next. Wrought or beaten iron, made by coal, is, however, very little in demand—the furnaces not being able to have many samples, and more than one-half of the fires are now extinguished. This can be accounted for, in consequence of the high price of cast metal, and the scarcity of coal in the forges which have high furnaces, requiring carbonic fuel to blast them, which they cannot obtain, is the chief cause of this closing of them. In certain localities, the price of coal, from the mine Bocurde, and washed, has risen from 8*s*. 3*d*. to 1*s*. 3*d*. the cwt. The general demand, in favour, at this present moment, is iron wire, for which they ask 6*s*. 1*d*. to 6*s*. 2*d*. This article also appears to be arising in the department of Franche-Comte. Several of the proprietors of the high furnaces, who have tried at various times to mix vegetable coal with coke, have entirely renounced it—as the great defect arising from this mixture, produces iron of a very inferior quality, which is soldered with great difficulty, and breaks under the hammer. The great impediments which exist to the progress of the manufacture of iron in France, are the want of good ore, and the exorbitant price of fuel.

THE IMPORTANT MINERAL DISTRICT OF THE UPPER MARNE.—We have already noticed the applications that have been made by the coal proprietors, and, more particularly, the metallurgic interest of the department of the Upper Marne, to the Minister of Public Works, that the Government will authorise the construction of a branch railway to pass by the town of St. Dizier. Every one connected with mining industry must be aware that this department is one of the most productive of any throughout France, of iron ore, as well as fuel, and that St. Dizier is the great iron mart of the country. It is, therefore, natural, where so much capital is embarked in mining operations, and the blasting of furnaces, foundries, and all improvements which can be made to ameliorate this important metal, either in a rough, wrought, or cast state, giving employment to thousands, that they should be desirous of partaking of the benefits that the introduction of railways will afford to mining and metallurgic industry throughout all the ore, carbonic, or bituminous departments. The great obstacles that have hitherto existed in France to the success of mining enterprise have been—first, the great deficiency of fuel, whether coal, charcoal, wood, or peat; and, secondly, the enormous expense of transport from the colts to the iron mines and furnaces, either by land carriage or water conveyance. The establishing of railway lines from one end of the country to the other, will cause a new era in mining operations from north to south, and east to west, not only as affording the means of a quick transit of mineral produce, but that, at a moderate expense, compared with the hitherto exorbitant charges that the mining industry has been obliged to submit to, but will give an impetus to enterprise and speculation, to work the rich iron and coal beds, which exist in so many of the departments, but are nearly neglected, in consequence of the expense of working them. The demand for iron is now becoming a subject of serious consideration, not only to speculators, but the French Government—as, 20 years ago, it never could have been anticipated that, in the year 1846, there would be railways from Calais to Marseilles, and from east to west, joining Germany, Belgium, and the north of Europe, by locomotive power, but more particularly the constructing of iron steam-vessels, which, less than half a century ago, would have been laughed at as a chimera, that the industry and intellect of man could produce the splendid ships which now excite the jealousy and admiration of all foreign powers, at the commercial glory and enterprise of Great Britain steaming majestically across the wide Atlantic Ocean, the Indian Sea, the Mediterranean, and the Baltic,—and, above all, our magnificent frigates, and armed steamers, forming one of the greatest bulwarks of this country. It is this extraordinary revolution that will be the means of bringing mining to be considered one of the most important branches of industry and commerce, not only in France, Belgium, Sweden, Germany, Russia, and all Europe, but also the New World. The Minister of Public Works having most attentively considered the just petition of the foremasters of St. Dizier, the whole department has had instituted a survey, for the purpose of ascertaining if there were any means to have a part of the railway, from Paris to Strasbourg, to pass through this mining city, comprised between Vitry-le-Francais and Bar-le-Duc. It has, we are glad to find, been reported by the engineers that the construction of this very requisite line, is most easy to be carried out between Vitry and St. Dizier, by crossing the plain of Perthois; but it was also found that a branch line from Blesme to St. Dizier, would not only answer the same purpose, without altering the direct trunk line, but insure to this town, and the department of Upper Marne, all the facilities of conveyance they so much desire for, and open a new field to the mining industry of the department. It is generally considered that the project of the branch line will be adopted, and the Council of Roads and Bridges (ponts-et-chaussées), will soon decide this important question.

THE BUILDING OF IRON STEAMERS IN FRANCE.—We have alluded, in former Numbers, to the progress, at least attempts, making by the French Government greatly to increase their steam navy: we will not give any more remarks on the imperfect state of the whole of their steam-vessels of war which have hitherto been built, either from not having well constructed boilers, and engines of sufficient propelling power for the size of the vessel, but made of that inferiority of material, that they have become worse than useless in boisterous weather,—no less than six steam-frigates having been wrecked during the last year, which is continually advertised upon in the Paris Journals. A new contract is shortly to be entered into, by the Minister of Marine, for the constructing of six iron steamers, intended for the western coast of Africa—two of which are to have engines of 300-horse power, and the four others of 200-horse power. It is specifically announced that none but French builders shall put up for the contract, and only those who may have already executed similar works for the Government, or those who can send in to a superior commission, to be appointed at Paris, their qualifications, offering every guarantee of a quick and good execution of such contract. The builders who intend putting up for the contract, must have sent in such written notice to the Minister, before the 31st of January—also, enclosing, if they have not already worked for the royal navy, testimonials which will prove their qualifications. After the commission has examined such qualifications and testimonials, letters will be sent by the Marine Department, announcing those who are admissible. Notwithstanding this notice, that none but French builders will be allowed to compete for the contract, it may not be amiss to state, that the cast material for constructing such vessels will no doubt be imported from this country, under the sanction of Government and the Minister of Marine, as it has been well proved that Louis Philippe has expressed, that there are so many improvements yet requiring to be made in the manufacture of iron in France, suitable for shipbuilding, that it would be a dangerous experiment to trust to it, and that only English-cast metal can be relied upon, much to the annoyance of the ironmasters of France, ever jealous of British industry and commerce. The same with machinery, as the real good engines and boilers on board the crack steamers of the royal navy of France have been either imported from this country, or made by English mechanics on the other side of the channel, where many are employed in various of the Government departments, but particularly in the railway foundries of the Orleans, St. Germain, Rouen, and Havre, and the leading established lines. It is stated that, besides the above vessels, M. Cave has been invited by the Minister of Marine to draw out the model or plan of a steam-engine of 550-horse power, for the consideration of the committee.

DISCOVERY OF COAL IN BARBADOES.—Sir Robert Schomberg, the chairman of the Barbadoes Railway, reports, in his last despatch to the London directors, that the geological formation of the Scotland district of the island, which, during his survey, he had opportunities to inspect, leaves little doubt in his mind that it contains coal measures so a great extent. We are enabled to add, in confirmation, the following from the *Barbadoes Standard*:—"A new light has lately dawned on us, pointing out the great probability—nay, the almost certainty—of obtaining an abundant supply of coal in the island, for engineering, and a vast number of other purposes. The inhabitants have hitherto remained in utter ignorance of this great advantage, which, we believe, has scarcely been supposed to exist with us, except by a very few. A gentleman, of an engineering propensity of mind, and of most scientific research and requirements, has been recently examining and considering the geological productions of the island, particularly those of the parishes of St. Andrew and St. Joseph; and although the time has been short, during which he has been experimenting, he yet feels disposed to hazard an opinion, that the substances found near the surface would induce him to suppose, that there are various substances in the country of a combustible nature, and that a useful coal is among them. We are not at liberty, at present, to enter into further explanation on the subject; we shall, therefore, conclude our remarks, by mentioning our expectation, of yet seeing a coal mine worked in Barbadoes. The constant emission of gas, from what is termed the 'boiling spring,' in Turner's Hall Wood, and which we have, with our very slender chemical means, ascertained to be nearly pure carburetted hydrogen, has always induced us to suppose, that it emanated from a formation of coal in the interior of the earth, and we are sanguine, sooner or later, seeing our expectations realised. What a new epoch it will be in Barbadoes, to see a railway established from our city to the parish of St. Andrew, and conveying from Turner's Hall to Bridge Town, hundreds of tons of coal daily, for the supply of other railways, of the steamers arriving here, and a large quantity shipped to the other West India Islands! We may also remark, that a bituminous substance has long been in use in Barbadoes; and a portion of this coal, analysed by Mr. Herapath, of Bristol (of which we gave full particulars in the *Mining Journal*, of the 24th ult.), produced the following results:—Bitumen, resolvable by heat into tar and gas, 61.6; coke, 36.9; ashes, 1.5; sulphur, none—100. It would furnish a larger quantity of gas than any other description of coal known, and, if mixed with hard charcoal, more refractory coal, or even earthy substances, would prove a very useful species of fuel.

CONTRACT BY THE FRENCH GOVERNMENT FOR BRITISH ROCK COAL.—The sealed contract for the delivery of 20,000,000 lbs. of English rock coal, intended for the service of the steam vessels plying between Algeria and Marseilles, was concluded on Wednesday, the 4th instant, by the Minister of Marine. Two competitors presented themselves for the contract—the one (Mr. Jackson), well known as one of the most fortunate of the English contractors, for the supplying of the French Government with British rock coal, whose price was 3*s*. 3*d*. per 2 cwt.; the other was Mr. Palmer (also an Englishman), who demanded 4*s*. This latter tender being more by 8*d*. per 2 cwt., Mr. Jackson had the contracts in preference. The conditions stipulated are, however, according to agreement, that this coal shall be conveyed to Algiers, Oran, and Boua, on board of French vessels. The greatest jealousy exists on the part of the French contractors, at the predominance, not only the contractors of this country, particularly Newcastle and Durham, have over all other nations, but also our iron manufacturers, whose industry, and the perfection of the metal, they cannot, nor will they ever be able, to compete with.

THE MONOPOLY OF THE COAL BASINS OF THE LOIRE.—We have alluded to this subject before at some length, as it has created a very great sensation in that extensive mining department, where the greater portion of the industry depends chiefly on the cheapness of carbonic fuel. This combination among the proprietors of coal pits, or collieries, has been the cause of many addresses having been sent to the Minister of Public Works at Paris, and the different Chambers of Commerce, as to its legality, and whether, by the law passed during the reign of Napoleon, in the year 1810, respecting the working of mines, iron, coal, or any other metallic or mineral produce, such a combination can be sanctioned by Government, as it is not only detrimental to every branch of industry, either in the manufacture of iron, or commercial enterprise, where fuel is required, as steam machinery has been generally adopted, within a few years, in all the manufacturing throughout France. The Chamber of Commerce of St. Etienne appointed a commission, as well as the Government, to investigate this question of the coalition, or amalgamation, of the coal proprietors, and the former have made their report to the Chamber of Commerce. This document is stated to be worthy of being placed by the side of the report made to the Municipal Council of St. Etienne and that of Lyon, as the parties who formed the commission were all, more or less, interested in the preservation of this arbitrary monopoly, and, consequently, their report is completely a partial one, to suit their own pockets. It will soon be published, but, in the mean time, the leading mine holders, forge-masters, and manufacturers, are bestirring themselves to know if the Government will allow them, and the public, to be thus imposed upon, by high prices, for so necessary an article of fuel, by a combination of colliery owners, who can charge what they please, and they, without any redress obliged to submit to it. We shall allude to this subject on a future occasion from the official documents.

DIRECT LONDON AND EXETER RAILWAY.—Elsewhere will be found in our columns, a full report of a meeting of the shareholders of the above company, held on Monday last. The resolutions of want of confidence in the managing committee, sufficiently show the sentiments of the meeting. We do not envy the feelings of any of the gentlemen composing it, any more than those of the chairman, who holds as well the chair, as that intermediate title, between plianism on the one hand, and the aristocracy on the other—above the former, with aspirations strong for the latter—a baronetcy. It will be remembered, that this gentleman was charged, on the 26th November last, with belonging to the rival companies of the Direct Exeter, and Central Cornwall Line, at the same time. This seemed strange, and was contradicted; but, at length, on the 15th December, he avowed the fact, with great apparent innocence, and stated, he became provisional director, and took shares, for a friend. A correspondent has given us some curious facts hereabout. Lieut.-Col. S. Hodgson, who became a member of the Direct London and Exeter, just as the extension to Falmouth was coming out, introduced his friend, Sir Bruce Chichester, both, we believe, then belonging to the Cornish Line. From the very earliest period their united efforts were directed to the suppression of the extension, and they succeeded. Far be it from us to say, that the fact of Sir Bruce holding some few hundreds of shares in the Cornish line for himself or his friend, would have any effect in inducing any prejudicial consequences to the Direct Exeter plan, though it unfortunately deprived it of its best feature—the unity of one line throughout. The fact, however, deserves the especial attention of the shareholders, should any unwise friends seek to restore him to the post he has vacated in obedience to the voice of his constituents. We are informed, that this gentleman has never yet relinquished his post on the Cornwall Line. By the way, speaking of friends, perhaps the worthy baronet will explain whether, having been associated in the Oxford and Salisbury Line with Dr. Blundell, Sir Henry Pynn, and Mr. allotment Shairp, the kind act referred to, was performed for either of these gentlemen, and which of them it was who deserved the appellation of his friend when he gave the explanation (?) we have mentioned. Oh, Sir Bruce! Sir Bruce! truly thou art a disciple of Janus. The liabilities of the whole committee, who have had charge of the money, will be determined by the Court of Chancery. It is believed, they are compellable to return all the money to the shareholders.

MINERAL WEALTH AND RAILWAYS OF INDIA.

(FROM A CORRESPONDENT.)
Since our last article upon this most important subject, we have received further intelligence, on which our readers may depend. Private letters have been shown us, which state that a report from the engineer deputed to act by the Honourable East India Company may be expected to arrive, if not by the next Overland despatches, very speedily afterwards, and that such report will be generally favourable. Two lines are very popular in India, in consequence of this impression, but one much more than the other, viz., the "East India Railway Company." We might have mentioned this fact in our former article, but we did not feel ourselves fully justified in doing so, from the imperfect information then before us. We can now, without hesitation, express a very strong opinion as to its probable success. The other line, which is looked upon also, but not equally favourable, is the "Great Western Railway of Bengal." Of its merits we do not feel ourselves competent to speak so decidedly. We are bound to say, however, that it has been well received in India. We have no doubt other lines are by this time equally popular, especially those that are shorter and have a more definite object, such as the prevention of difficult, dangerous, and most expensive navigation up the rivers to the great commercial depots. Other circumstances have transpired of great importance as to the economy of construction. Not only is there excellent iron in India from the Porto Novo works, as alluded to in the letter with which Messrs. Fletcher, Alexander, and Co., favoured us, and which Mr. David Musket has declared, from its "steely character," to be preferable to our own iron for such purposes; but there are many of the indigenous woods of India, which, by the application of Sir William Burnett's or Payne's patents, may be so indurated and hardened, and preserved from rot and insects, so as to answer all the purposes of iron. From evidence before us, we are inclined to believe that railways may generally be constructed in India at somewhat less than a third of their average cost of construction in England. This has already been the case in America in several instances, where the wages of labour are high, while in India those wages rarely amount to more than twopence per day.

The reduction and postponement of railways in England, by the recently formed "Committees of Selection," in both Houses for that purpose, will doubtless direct the tide of speculation to the railways of our colonies, which are not to be so reduced or postponed. Of all our colonies India is the most important, and likely to be the most productive. It can scarcely be called a colony—it is a great empire belonging to us. Sir Robert Peel's new tariff, when it is passed, of which there is little doubt, will let in the immense productions of India without duty, or at nominal duties. Those productions will enormously increase annually, if fostered by internal railway communication. The quadruple multiplication of traffic created by railways between the points of termini in England, so far as goods is concerned, will form no comparison with the increase in India. We have some doubts as to the passenger traffic for a few years, from the exceeding poverty of the people, but none as to the goods, and none as to the passengers ultimately. Railways create riches, and labourers participate in these riches; the labourers of India will in time be no exception to the general rule. Their wages will increase from the demand for their labour, and so will their civilization and happiness. Without derogating from the merits, as well as successes, of the pious and learned missionaries who have gone over to Christianise them, we shall expect more from railways than from orators, however zealous or eloquent. The great evil of castes, which for a short period may impede passenger traffic, must in time give way to its vast advantages, and the noble objects of the philanthropists and the philosophers of India, Sir William Jones, Bishop Heber, the Rev. Mr. Carey, Rammohun Roy, and others, be effected by means of speculation, for profit, after they had totally failed, when attempted from pious and holier motives.

Leaving this rather discursive matter, we might enter into the mineral riches of India, as well as the products of its luxuriant soil. Should a war with America take place, which we not only deprecate, but disbelieve, India would supply us with cotton and sugar in any quantities. Even at peace with America, India with railway communication could successfully compete with her, and it only requires the establishment of railways in India, to make the United Kingdom independent of all nations for the raw materials of her best manufactures.

THE PROJECTED SHIP CANAL ACROSS THE ISTHMUS OF TEHUANTEPEC.

We have alluded particularly, in two preceding Numbers, to the grand project of forming a ship canal across the isthmus of Tehuantepec, so as to join the Pacific and Atlantic Oceans, which great undertaking has been conceded by the Mexican Government to their experienced engineer, Senor Don G. Mora. As the position and resources, both mineral and commercial, of that portion of the Mexican Republic, may not be generally known to our readers, we have no doubt the following account will be interesting:—This isthmus forms part of the departments of Oajaca and Vera Cruz—the former, according to the Government returns, contains a population of about 500,500 inhabitants, and the latter 250,500. The boundaries of these two districts are not yet definitively settled, but the line of division is generally considered to coincide with the course of the River Sarabia, which is confined to the left side of the Coatzacoalcas, but not on the right. The southern part of the isthmus, which comprises the department of Oajaca, is divided into two sections: the first occupies the plain, which extends from the Pacific Ocean to the foot of the Sierra (mountain), and the second belongs to the Sierra itself. Politically, the southern lands of the isthmus constitute the greater part of the district of Tehuantepec, and comprise 24 municipalities; the town of Tehuantepec is the head of the district, and the residence of a prefect, a judge of first instance, a military commander, and a parish priest. Juchitan and Petapa are the heads of two sub-districts. This portion of the isthmus is ecclesiastically dependant on the diocese of Oajaca, and in addition to the parish of Tehuantepec, has five rectories. The whole of the southern territory contains about 31,000 inhabitants. The population of this division is composed of Europeans, Huaves, Zapotecos, Mijes, Soques, and Zambos. The Europeans, as regards numbers, constitute an insignificant portion of the population, and are disseminated over various localities. The Huaves are in all little more than 3000, and occupy the four villages of the coast, viz., San Mateo, Santa Maria, San Dionisio, and San Francisco. They are generally robust and well formed, and some of them very intelligent. The Zapotecos constitute the greater part of the southern population of the isthmus, and almost exclusively that of 16 villages out of 24. The natives of Tehuantepec are superior to those of any other part of the republic, not only by their civilisation, but their intellectual qualities, which are of no mean order: they are vigorous, and of a pleasing aspect, and the women may be justly termed a *fair sex*. The Mijes constituted formerly a powerful nation, and they still occupy the land from the Sierra, north of Tehuantepec, to the district of Chiapas: they chiefly inhabit the village of Guichicovi, and a small portion of the Sierra: the number of these people is nearly 10,000. The Soques, who came originally from Chiapas, inhabit only the villages of San Miguel and Santa Maria Chimalapa: they are naturally kind and obliging, even tiresomely so. They cultivate sufficiently maize and tobacco for their consumption. The inhabitants of Santa Maria extract also some annatto, and supply the whole of the southern portion of the isthmus with the delicious orange, which grows abundantly about their settlement. The Zambos are a half-cast between the Indian and the Negro, and are chiefly found in the estates of the Marquis del Valle, and also mixed with the Zapotecos, in the villages of Zanetatepec, Niltpepec, Petapa, Barrio, and Santo Domingo. They are robust and industrious, working as labourers in the fields, and applying themselves to the cultivation of wheat, indigo, and cochineal.

The climate of that portion of the country, which, in this part of the isthmus, extends from the shores of the Pacific to the foot of the Sierra, is in general warm and dry, but extremely salubrious. Among the advantages offered by the isthmus for the execution of the proposed grand work, that of a mild and healthy climate precisely in those localities, where the assistance of European workmen would be required, is, by no means, the least considerable. The mineral productions are iron, which is found in abundance; there are also rich gold and silver mines, but they have, as yet, not been worked. Vegetation, of every description, is abundant, dye woods, resinous and balsamic trees, are very prolific; and both the soil and the climate are extremely favourable to the cultivation of the sugarcane—one factory alone, in the neighbourhood of Chihuitan, belonging to Messrs. H. Gobert and Olivier Gourjon (the former a German, and the latter a Frenchman), yields 100,000 lbs. annually, of the value of 2000*l.*, and 1000*l.* more for the brandy distilled from the molasses; but, before long, the quantity of sugar will exceed 250,000 lbs. annually; and indigo, the annual crop of which is about 120,000 lbs. annually, of the value of 24,000*l.*; likewise cotton, of a very superior quality; the dales are also covered with palm trees. There are innumerable species of fruit trees, very luxuriant, and two kinds of vine, bearing fine flavoured grapes, the plantain, orange tree, two species of spontaneous cocoa, and the mamee sapota, ginger, sarsaparilla, vanilla, and the bixa orellana, from which annatto is extracted to a great extent. Oxen, cows, sheep, horses, mules, and animals of every description, whether tame or wild, are plentiful all over the isthmus. One of the great resources of this part is the salt pits, which are so numerous, that it would be difficult to determine the quantity they yield; but those that were worked on account of Government alone, have been ascertained to produce above 75,000 lbs. annually—it is of a pure quality and extremely white. In the departments of Chiapas and Oajaca, the annual produce, derived from its consumption, amounts to about 8000*l.* Its cost to the Government was, on the average, 1*s.* per 100 kil., or 2 cwt.; since being of spontaneous formation, and not requiring any operation whatever, the expense was limited to the mercantile charge from the works to the place of deposit.

The northern division of the isthmus is the department of Vera Cruz, which belongs to the district of Acayucan, and was formerly one of the most densely populated of the Mexican empire. Since 1831 the condition of this country has considerably improved, as may be inferred by the buildings that have been erected in the chief town of the district, as well as by the flourishing plantations of cotton and tobacco, not one of which existed at that date, but have since acquired some importance. In comparing the Coatzacoalcas, by which the canal will join the two seas, with the rivers Mississippi, Bravo, Panuco, Alvarado, Tabasco, Magdalena, and Orinoco, it shows a very great preference to the former, as the waters of the Coatzacoalcas are always clear, even in the greatest floods, and there are no logs of timber to obstruct its course, although it runs through a continuous forest—this favourable circumstance being undoubtedly owing to the gentle current, and the tenacity of its banks. The rivers Uspanapan, Coahuap, Coahuap, San Antonio, Tancochapa, and Zanapa, are of more or less importance, and navigable, watering the plains lying on the right of the Coatzacoalcas. The territory on the west of the river is also intersected by immense rivers, among which the Jaltepec and the San Juan are the most remarkable. The former joins the Coatzacoalcas, running through a country remarkable for its magnificent vegetation, and, there is no doubt, a great portion of its course might be navigable for steamers; the latter falls into the Atlantic by Alvarado, and the Acayucans follow its course, when going to Vera Cruz, between which port and the chief river, it is asserted, that a water communication might very easily be established. In the district of Acayucan there are 16 municipalities. The climate is rather damp, compared with the south, receiving the sprays of the wide Atlantic, but is, by no means, unhealthy, being of a very moderate temperature. There are supposed to be several rich mines of precious metals at the heads of the rivers Jaltepec, Uspanapan, &c., and two mineral veins are stated to exist in the neighbourhood of the village of Joteapa, which were denounced, as early as 1527, as being of silver. There are also several coal mines of a superior quality, none of which have as yet been worked. The sugar-cane, coffee, and cocoa, prosper throughout this district, and are cultivated in the neighbourhood of almost all the settlements.

With respect to the geological resources of the isthmus, the great cordillera of the Andes gradually becomes narrower, and diminishes in height: its direction is nearly from east to west, and parallel to the coast of the Pacific, nearer to this than to the Gulf of Mexico, so that the natural division of the waters is about seven times more distant from the latter than it is from the lagoons of Tehuantepec. Northward of the upper lagoon, the Sierra is divided at its narrowest part by a longitudinal valley; westward and eastward the Sierra again widens, and rises to a great height. The principal rocks in these mountains are milk quartz, granite, syenite, greenstone, argillaceous porphyry, greywacke, primitive limestone, slate schist, compact limestone, and claystone. The stratified rocks are so much broken up, and disturbed by plutonic action, and so intermixed with them, that their respective relations are with difficulty discernible. In the narrow part of the Sierra, the nucleus is of milk quartz, disturbing the stratified rocks, mixed up with the fragments of the quartz which has intruded itself into the fissures. On some of the hills, the porphyry is accompanied by common greywacke. Near Guichicovi and Niltpepec, magnetic iron is also found in great abundance, slate, quartz, talcose, similar to pearlstone, which is only, however, silicate of alumina. There is plenty

of granite; limestone (sometimes stinkstone) is traversed by veins of calcareous spar and pearl spar, in some of which fragments of diorite are met with; it is an excellent marble, of a smoky, and sometimes of a yellowish and blue, colour—whilst the limestone is dolomitic. To give a full geological description of the isthmus, would be too lengthy: suffice it to say, that its formation is most valuable, and there is very little doubt that, if the country was well explored by scientific mineralogists, some rich mines would be discovered in the Cordillera, so productive. Besides, the admirable fertility of the soil, and abundance of cattle and resources of all descriptions, would enable the vessels, when once the canal is cut, to renew their provisions at easy prices at the isthmus; therefore, they might devote a greater portion of their gold to the storing of merchandise. Besides these purely local advantages it offers over those of Nicaragua and Panama, is the genial climate, and not being subject to dangerous north and north-easterly winds, and the number of its population is upwards of 750,000 inhabitants. Another advantage is, that the steam-packets of the Royal West India Steam Company are constantly touching at Vera Cruz, whereby a constant communication would be kept up, not only with Europe, but the British West India Islands, the Havana, Cuba, &c. We have no doubt that this grand enterprise will be carried out, and that the exertions of Senor Don Jose de Garay will be crowned with success, and receive every encouragement from the mercantile and mining interest of the Old and New World, which they certainly deserve.

X PROGRESS OF FRENCH MINING INDUSTRY.

(FROM OUR PARIS CORRESPONDENT.)

A Marseilles newspaper publishes a letter from Tenez, in Algiers, stating that a vein of coal has been discovered on the banks of the Oued Abella, about a league from that place. The coal from the upper part of the vein is so bad, that it will not burn at all; but lower down it is said to be of very excellent quality. An application for a concession of the mine has been addressed to the Government by Messrs. Courlet and Bourgaud. If, as is expected, this mine should turn out to be a valuable one, the importance of its discovery cannot be overrated; for thus far the want of coal or wood has been considered an almost insurmountable impediment to the utilisation of the mineral wealth of Algiers, especially of its iron and copper. The French Government entertains the highest expectations of being able to make its African colony supply all the minerals that France either lacks altogether, or possesses but sparingly; and this discovery of a coal mine certainly confirms, to a certain extent, the conviction that those expectations are not unfounded.

A contract for 11,000,000 kils. of English coal, destined for steam-vessels in Algiers, was taken at the Ministry of Marine, on the 4th inst., by a Mr. Jackson, at 4*s.* 4*d.* the kilogramme. Mr. Palmer, who accepted the last contract of the kind, offered 4*s.* 8*d.* per kilogramme.

The great question of the abolition of the duty on iron for shipbuilding has undergone no discussion since my last; but it is not lost sight of. It is waiting its turn to be brought before the Chamber, and, meanwhile, partisans and opponents are preparing for the struggle that will there take place. The classes interested in the merchant marine appear quite confident that the abolition will be carried; I think so too, and so will think every one who has taken the trouble to peruse the official accounts of the deplorable decline of the merchant marine of this country, which have been published in the *Mining Journal*. To those accounts, which were exclusively of a mercantile character, may be added arguments drawn from military and national considerations. For instance, France has 244 ships of war to protect 13,656 merchant vessels, England has 363 ships of war to protect 30,980 merchant vessels, the United States have 68 ships of war to protect 20,000 merchant vessels; or, to count in another way, France has 5000 guns to protect 500,000 tons, England 10,000 guns to protect 3,000,000 tons, the United States 2000 guns for 2,000,000 tons. From this it is clear, that the navy of France is too big, or her merchant marine too little. That the navy is none too big, the entire nation would unhesitatingly declare; and, consequently, the merchant marine is too little, and all pains must be taken to improve it, which can only be done by building vessels of iron, instead of wood—and admitting that iron duty free. Besides, the merchant service is a nursery for the national navy. From her merchant navy England could draft to her national navy, in time of war, tens of thousands of first-rate sailors; but where would France be able to restock her navy, when her merchant marine is in so deplorable a state?

Sir Robert Peel's measures are beginning to encourage the partisans of free trade to demand the adoption of similar measures in this country. France is backward, slow to understand, and extraordinarily timid in matters of commercial reform; but, still, I should not be surprised to see—it would be foolish confidently to expect—some extensive modifications of her tariffs proposed in the course of the present session. Any modification whatever, no matter how slight, could not fail to be advantageous to our commerce; and, if some sweeping measure like that of Sir Robert Peel's were carried, the results would be incalculable. No class, however, would benefit more than that which you represent; for, notwithstanding the vast development which the mineral industry of France has taken—the production of iron, for example, having increased from 86,154 tons in 1822, to 308,445 in 1843—it could not withstand a moment against ours. But, for this year at all events, I fear that our ironmasters must content themselves with the abolition of the duty on iron for shipbuilding, hoping that it will pave the way for the abolition, or at least the reduction, of duty on iron generally. Nevertheless, it is right to add, that one or two of the most influential of the daily newspapers have called for a very considerable reduction in favour of the railways; and perhaps it may be expected, that certain deputies will warmly advocate such reduction in the Chamber.

At their last meeting, held on the 4th inst., at Brussels, the ironmasters of Belgium settled the prices of iron as follows:—Cast-iron from wood: from *entre Sambre* and *Meuse*, 18*s.* 50 c. the 100 kil.; from *Meuse*, 17*s.* 50 c.—taken at the foundries. Iron from wood: from *entre Sambre* and *Meuse*, 43*s.* f. and 40*s.* f., according to quality; from *Meuse*, 40, 38, and 36*s.* f., delivered free at Liege, Brussels, Mons, Namur, Charleroi. Iron *fendres* from wood, 210*s.* f. the 1000 kilogrammes—taken at the forges. Sheet iron from *entre Sambre* and *Meuse*, 58*s.* f. the 100 kil.—free for Liege, Brussels, Mons, Namur, Charleroi. Cast-iron from coke: No. 1, 16*s.* 50 c. the 100 kil.; No. 2, 15*s.* 50 c.; No. 3, 14*s.* 50 c.; refined, 12*s.* 50 c.—taken at the forges. Iron from coke: No. 1, 25*s.* f.; No. 2, 28*s.* f.; No. 3, 30*s.* f. the 100 kil.—free at Liege, Brussels, Mons, Namur, Charleroi. Iron *fendres* coke—*ferts*, 130*s.* f. the 1000 kil.; *metis*, 120*s.* f.; *fendres*, 110*s.* f.—taken at the forges. Sheet iron, 40*s.* f. the 100 kil.—free for Liege, Brussels, Mons, Namur, Charleroi. Rails—coke: for railways, 80*s.* f. the 100 kil.; for coal pits, 28*s.* f., delivered free.

The shareholders of the company of the Zinc Mines and Foundries of Stolberg and Prussia are invited to meet at Aix-la-Chapelle, on the 25th of Feb., to elect the board of directors. The King of Prussia sanctioned the bye laws of the company on 31st Dec. last.

At a meeting of the Great Northern Railway Company, held last Thursday, it was stated, that the first section of the railway from Paris to Clermont, and the last from Denain to Valenciennes, would be opened at the end of March or beginning of April; the other sections in May, and the whole of the line in June or July. 175 locomotives, and 3250 carriages and waggons, will be required for the railway and its embranchments. An amalgamation between the company and the Creil and St. Quentin Company was adopted unanimously.

The value of copper ore sent to France from Algiers, during the first nine months of 1845, was only 22,770*l.* (rather more than 900*l.*), but it is increasing every month. In the depots of Paris there were, on the 31st Dec., 1,261,607 metrical quintals of cast-iron; 382,177 quintals entered; 458,130 went out; and there remained, 31st Jan., 1,185,654. Of lead the quantity, on 31st December, was 150,644; there were neither entries nor deliveries, and the quantity was, consequently, the same the 31st Jan. The quantity of other metal, at the end of Dec., was 216,580 metrical quintals; there entered, 1309; and went out, 1304—216,549 remaining the 31st ult.—Paris, Feb. 10.

THE PLATE GLASS COMPANY.—The half-yearly general meeting of the proprietors of this company was held at the Piazza Hotel, Covent-garden, on Thursday, the 12th inst., to declare a dividend, and on other matters. In proceeding to the general business, W. BLAXFORD, Esq., was called to the chair.—J. E. SAUER, Esq. (the secretary) read the report, which showed a great increase upon the past half-year compared with the previous or any half-year since the company has been established, which was mainly attributed to the sound policy and indefatigable exertions of the present directors, and also from the reduction of the duty upon plate glass—which has caused such a call for that article, that the present works were insufficient for the increased demand which has caused the directors to enlarge them to some considerable extent, in fact, to nearly double the original size. The divisible profits, after leaving a handsome balance for the deterioration fund, was declared at 6 per cent.—A motion was made by Mr. KNOX, and seconded by Mr. POSEY, that the sum of 350*l.* should be placed at the disposal of the directors.—A PROPRIETOR inquired, what was the amount annually set apart for the directors?—The CHAIRMAN said, 700*l.* between the board.—Mr. CHAMBERLAIN made some few remarks that the time was not come yet for any addition to the 700*l.*—The original motion was put to the meeting, and was passed unanimously.—The directors who went out of office, were Messrs. Hemming and Blandford, who were re-elected.—Thanks being moved to the chairman and directors, for their indefatigable exertions in the prosperity of the company, J. M'RAE, Esq., replied in a neat and appropriate speech, and said that nothing should be wanting on their part, to merit the good opinion and cordial support of the proprietors.—The meeting then broke up.

IMPROVED CUPOLA FOR MELTING IRON.

CONSTRUCTED BY MESSRS. FRANKLIN TOWNSEND & CO., ALBANY, N. Y.

This cupola is of the ordinary construction, only being of enlarged dimensions, and made of cast iron. Its diameter at the *tuyeres*, when lined with fire brick, is 3 ft.; and its height, from the hearth to the charging door, 11 ft. When charged full, it will contain 3 tons of pig iron, and is capable of melting upwards of 12 tons at one blast. The air is admitted into the cupola by six *tuyeres*, which are placed about 15 inches above the hearth, and equidistant on the circumference of the cylinder. To avoid the number of pipes which would be necessary if the air were conducted into the cupola by the usual method, an air chamber is made to surround the cylinder and enclose all the *tuyeres*, and into this the main blast pipe is introduced. An opening is made through the outside of this air chamber, and directly opposite to each *tuyere*, which, being protected by a plate of glass, allows the *melter* to observe the working of the furnace. This plate of glass is so attached that it can be easily removed, and thus give free entrance to clear the *tuyeres* whenever it may be necessary.

The air is heated by being forced through a number of small pipes, placed in such a manner in the interior of the stalk immediately above and directly over the cylinder of the cupola, that their outside surfaces are exposed to the full action of the waste heat of the furnaces. For reason of the difficulty caused by the expansion of the metal when heated, these pipes are required to be of peculiar construction. By this arrangement, the air becomes heated during its passage from the blast reservoir to the *tuyeres* upwards of 400 deg. Fahrenheit's thermometer. This cupola has been in operation during the past three months, melting 10 tons of iron daily. The iron is charged in the shape of pig and scrap (*spices, gates, &c.*) in about equal proportions, and is cast into stove-plates, which requires that it should be very hot and liquid. The average consumption of coal (Lehigh) in melting this quantity of iron, is 225 lbs. to the ton of iron, and the rate of melting is from 2 to 3 tons per hour. An ordinary cupola, operated with cold blast, consumes upwards of 500 lbs. of coal to the ton of iron, and its rate of melting is from 1 to 2 tons per hour.

Not having the results of the operation of any hot blast cupola in this country, the comparison of the working of this improved cupola with them cannot be given; but its evident superiority to those of England is shown by the following extracts from a report made by M. Dufresnoy, chief engineer of mines:—"The cupola furnaces at the Tyne Iron Works" are operated with heated air. The consumption of coke is 280 *livres* (369 lbs.) to the ton of iron; rate of melting, one ton per hour. At Wednesbury, the cupolas are operated with hot blast, and consume 260 *livres* (287 lbs.) of coke to the ton of iron. Before the adoption of the hot blast, the consumption of coke was 400 *livres* (441 lbs.) to the ton of iron. The same quantity of iron is melted in one-half of the time that was required before the adoption of this process."

IMPROVED METHOD IN THE LIGHTING OF MINES.—The improving of the lighting of coal mines, since there are so many accidents occurring from fire-damp, or hydro-carburetted gas, is attracting the serious attention of the first engineers, philosophers, and chemists, not only in this country, but in France and Germany, to discover a more perfect means of guarding against the effects of this destructive element, where operations are carried on an extensive scale, and the lives of hundreds constantly exposed to an untimely end. It has been proved, from long experience, that although the Davy lamp, in the generality of cases, has been attended with a doubtful confidence by the miners, it has, however, frequently been successful; and the greater portion of the coal-mine proprietors have resorted to it, for the want of a more effective method of lighting the workmen, and one which can be relied upon with security. It is this important subject which now occupies public scientific research in mining Europe. We extract the following remarks from the *Paris Moniteur Industriel*, communicated by M. Sainte Preuve to the Society of Encouragement for the National Industry of France:—"Several engineers have proposed, for some time, the electric light. Messrs. De La Rive and Grove have given to this solution some very ingenious variations; but it is not necessary to resort to expensive apparatus, by the assistance of which are produced electric currents, to obtain the object in question. In the first place, it appears to me, the process of the pure ventilating of the mines should attract the serious attention of the proprietors of collieries, and not to fear the trifling extra expenses that the establishing of it would incur. Secondly, there ought to be a certificate, or declaration, made after a minute examination of the mines, of the nature of the inflammable matter in the full extent of their cavities, distinctly from the pits, or galleries, where the miners may be at work, and likely for the hydro-carburetted gases, or fire-damp, to introduce themselves. It would only be a trifling outlay, and very little inconvenience, to introduce, by means of tubes, pure air in these excavations; and, by larger pipes, or chimneys, which would be open to the atmosphere at the top, take off the whole of the foul gas arising from the coal. I had remarked upon this subject in a monthly review several years ago; but, as I have stated to the Council, I have found since that period, in a patent of Labou, the same idea applied, not to mines, but to habitations only lighted by gas. Another experiment, which has only been tried on a small scale in the apparatus of laboratories; but which, nevertheless, is interesting and curious, not merely in an historical point of view, as well as practical, consisting in lighting mines by a slow combustion, and, as it is termed, *without flame*. By this means, they can burn vapours in a vase, closed nearly hermetically by a glass covering, and when the air would have but a slow and suitable gradual access. They can keep to the desired degree the temperature of this slow combustion, and the lighting power is obtained by the means of a porous body previously heated. The ether and the platinum wire employed in this sense, at the chemical lectures, are not, thank God! the only materials that can be adopted to this use. It is, therefore, easily to be understood that the proportion mixture—comparatively weak of hydro-carburetted gas with the atmosphere of the vase, where the slow burning of the vapours is under process, furnished in abundance by a liquid mass—cannot do otherwise than sensibly modify the thermometrical state of the quantity of light, and determine, by a calorific or heated propagation towards the outside of this vase, the explosive inflammation of the hydro-carburetted gases which may be dispersed in the mine. Otherwise, great obstacles would be brought into contact with the too free communication of the internal atmosphere of the vase with that of the mine itself. I can vouch that lighting apparatus thus disposed, produce a sufficiently strong glare to light the works of the coal mines; I may also prove the examples offered by China in their method of lighting, if not identically the same, and so safe, are at least analogous, by means of certain coals; but I must observe, that neither the one nor the other of these means of preserving life from explosion by fire damp, will ever be effectual in putting down the grand cause of it, until the working miners discontinue the smoking of pipes and cigars in mines, notwithstanding the strict orders they have to refrain from it, and which has been the principal cause of the accidents that have happened in every country; and as has already been proved by a most experienced engineer, who forms one of the Council of the Society of Encouragement, a powerful ventilation alone in the greater number of cases, can combat with success against this effect, and that of the lamps, by purifying the atmosphere in mines, as it too frequently happens that many are most badly conducted and organised."

THE MANUFACTURE OF CROWN AND FLINT GLASS.—It is well known, that there is no country in the world where the making of glass, of every description, has been brought to so high a perfection as in England. Her telescopes are considered as a little treasure by every nautical man throughout the world, for the purity and correctness of power. In optics we are looked upon by all nations as the first, and of late years many foreigners have been over to this country, for the purpose of studying our method of fabrication. The French Government has offered high premiums in the improvement of this important branch of industry, and very great ameliorations have been recently made in the manufacture of glass by M. Bontemps, director-in-chief of the extensive glass manufactory of Bhoisy le Roi. The following are the proportions employed in the composition of flint glass and crown glass:—*Flint glass*—Sand, 43.5; oxide of lead, 43.5; carbonate of potash, 10; nitrate of potash, 3—100 portions. *Crown glass*—Silicium 60; carbonate of soda at 90 deg., 25; carbonate of lime, 14; arsenic, 1—100. The carbonate of soda, or part of it, may be substituted by borate of soda, as in this case crown glass is less likely to attract the humidity of the atmosphere, that being one of the greatest defects of this description of glass, and only overcome by a lengthened fusion. Pure crown glass can also be produced, and less subject to devitrification, in employing carbonate of potash, instead of carbonate of soda; but, by this method, the opticians complain that it is not sufficiently dense, which obliges them to make too lengthened focusses. Great improvements are making in the manufacture of glass in this country, and by the wise measure of Government, taking off the obnoxious duty that oppressed this branch of industry, it is becoming daily more prosperous.

IMPROVEMENTS IN THE MANUFACTURE OF METALS, BY APPLICATION OF VOLTAIC ELECTRICITY.

BY ARTHUR WALL, ESQ.

The application of electricity, to the manufacture of iron and other metals, is unquestionably not only a most interesting process, but one from which results of the first consequence may be calculated. It is now some four years since the process was first introduced, and after contending with that degree of prejudice ever attendant on inventions, more especially where they appertain to manufactures on so extensive a scale as that of the production of iron, steel, copper, &c., it would appear to be now coming into general use. As regards iron, some notice of its manufacture in former days, and the improvements of late years, embracing those of Cort and others, and bringing them up to those now under notice, will be found of interest; while they will form additional data to that which has already appeared in our columns, from time to time, on the subject of the advancement made in the manufacture of metals. It is now not more than 60 years since, that bar-iron was made by means of charcoal, to which coke was added in small quantities. The metal thus produced, we are given to understand, was hard, and, consequently, brittle, and deficient in strength, requiring much time in its conversion—the largest works turning out not more than 20 tons per week. About the year 1790 Mr. Cort applied the process, known as "puddling," the operation of which, as known to the generality of our readers, consists in exposing the iron to the flame of pit coal on the hearth of a reverberatory furnace, being kept continually stirred with rakes. A further process was also introduced, that of previously melting the cast-iron with coke, an operation known as "refining." The cast-iron, thus acted upon, became, after undergoing the process of puddling, a strong cohesive metal, which was then subjected to the application of steam, or other power, in reducing it into a more compact mass, by "beating" it under a hammer. Having been reheated and rolled, it then became malleable iron. It appears, however, that these advantages had not been long secured, ere a considerable falling took place, arising from the deterioration in the quality of the materials employed. The ores then used for making cast and bar-iron were principally the brown and red hematites, with a small proportion of the earthy iron ores, minerals far purer than the clay iron stone of the coal formation, which latter is almost exclusively employed at the present day in the smelting of pig-iron, although an admixture of the hematitic ores is used principally in Wales, a large proportion of which is obtained from Cornwall, and other localities, in addition to the Ulverstone ore, on which, we believe, the works were at one time mainly dependent. It is also observed, that the crude materials are further deteriorated, or affected, in the manufacture of iron, by subjecting them to the action of raw coal, and the application of the hot blast.

This latter process, however, although it seriously affects the iron made in Scotland, as being "rotten," does not apply to the use of anthracite in Wales, nor can it be said to affect the produce of iron in South Wales in any equal proportion—while in Staffordshire and Derbyshire we believe the cold blast is most generally applied. The following statistics afford matter of interest:—In 1740, the cast iron made with charcoal was 17,350 tons. In 1788, the produce had increased to 61,000 tons—of which 48,000 tons were made with coke. In 1796, it had advanced to 125,000, nearly the whole of which was produced from coke. In 1806, the produce was 250,000; in 1820 400,000 tons; in 1830 677,147; and in 1840, the yield is stated at 1,866,400 tons, to which a considerable increase has since taken place, as noticed in the statistics on the trade in our columns. There can be no question but that any improvement in the manufacture of iron must be considered not only with reference to the economy in the process, whether of time, or in a pecuniary sense, but as regards the quality of the metal produced, more especially when we reflect on the mournful accidents which have occurred, both as relates to machinery, and the lines of railway, to which public attention has so frequently drawn of late. It is not perhaps to be expected, that ironmasters will direct their attention to improvements, which involve the trouble and cost attendant on alterations in their several establishments—while they have to compete with works where the quantity, and not the quality, is the first consideration. It, therefore, behoves the consumer—those parties on whom the ironmaster must in the end depend—to determine on the quality of the material, and test it before its application, as on them devolves the responsibility, so far as the public is concerned. It is, therefore, that at the present moment, when the demand for iron is so rapidly on the increase, that the appearance of Mr. Wall's process may be considered most opportune, as offering a simple and economical mode whereby the impurities, which are contained in our iron, are got rid of—and, at the same time, bringing the metal more nearly to that produced in Sweden and Russia. The experiment first made by Mr. Wall, it would appear, arose from observations on the effects produced by voltaic electricity, as exemplified by Sir Humphrey Davy—that gentleman's attention having been, some five years since, directed to the object of the patent secured by him, but which has in a measure been in abeyance. It will be our object briefly to notice the results of experiments to which the patented process has been subjected; and so far as we can collate evidence from the material before us, to demonstrate the advantages attendant on the process, in the hope that, by it becoming more generally known, its application will be universal, and duly appreciated.

From the statements of Mr. Wall, it appears that, in one instance, Welsh pig iron having been subjected to the process of electricity, and recast into pigs, was afterwards rolled at Birmingham, and subsequently brought back to London, and the strength of which was tried by Messrs. Brown and Lennox, of Mill Wall, where it was subjected to the testing machine, and worked both hot and cold, as well as being made into chain iron. From the experiment thus made in October, 1843, it appears that iron of 34 inch link broke with machine, after having borne several strains; 4 inch full, measuring 74 inches long, from 10 to 22 tons, elongated from 84 to 94 inches. The iron so tested was transmitted to Birmingham, with the view of determining its value, and the qualities it possessed—the result being, that the value was stated to be 8l. per ton (October, 1843); and, moreover, it being superior by 20 per cent. over that of Welsh or Staffordshire iron. Mr. Wall subsequently visited some of the larger iron-works in the north of England—among which were those of Milton and Parkgate, near Sheffield, in May, 1844, when a further experiment was made, from which the results were of a highly satisfactory nature. In submitting the electrified iron, with that produced from the ordinary manufacture, it was found that the only difference observable between the two metals was, that the electrified appeared torn and fibrous at the fracture, indicating force of cohesion. It was found to puddle much the same as the ordinary metal, only thinner; but bulled rapidly and soft. Dr. Ure, who entered into the merits of the process, and to whom a statement of the proceedings was submitted, expressed his opinion, that a saving of 85 per cent. in the manufacture of iron would be effected by the application of the process. Some experiments of an important and interesting nature were subsequently made by Mr. Hawthorn, at the Milton Works, as also at Butterley, and certificates from numerous parties are given, which are of a highly satisfactory nature.

It is well known that the atmosphere seriously affects the working of a blast furnace, and that its changes are invariably attended by corresponding alterations in the quality of the metal produced, the furnace at times assuming a different state, at one time being found to "scour," while at others the running of the metal, or cinder, is altogether of an opposite nature. Convinced of the active agency of electricity (observes Mr. Wall) I naturally felt a great interest in watching the effect of a well-regulated battery on any sudden alteration of the weather taking place. "In the ordinary mode (continues that gentleman) of manufacturing, any excess or deficiency in the concomitant materials, as of limestone for example, produces in a few hours an important change in the quality of the metal produced. These different sorts are designated by the terms, white, mottled, grey, &c. For the purpose of experiment, therefore, I caused the feeds or charges of the smelting furnace to be frequently varied; sometimes the quota of limestone was increased or lessened to an extent of one fifth beyond the usual complement. At other times a similar proceeding was observed in regard to the ore; still, where the action of the battery was regularly kept up, scarcely any alteration was perceptible; and it was not until the lapse of three or four days, that any material change was to be observed. On the other hand, when the smelting furnace was regularly supplied, and the charges uniform, not any variations in the atmosphere, however sudden and determinate, caused the slightest alteration. The metal was the same, the cinder equally smooth and clear in damp and stormy, as in dry and frosty weather. The regularly maintained action of the battery, counteracting all excess in the relative condition of the two electricities, preserved an equilibrium in the working of the furnace, which delivered out its contents in one unchanged state and quality. In the ordinary process also, it was by no means rare to find Nos. 2, 3, and 4, together in the same bed, from the same tapping; owing to a derangement in the furnace, and an unequal distribution of carbon; while the electrified charges were alike in every particle, without mixture or alloy."

"This last circumstance was most satisfactorily shown (continues Mr. W.), while I was operating at Dowlaish during the early part of the month of December, 1844. On this occasion there were four furnaces, each working according to a different arrangement, and each fed by a distinct species of ore. The one making white, or inferior metal, was selected for the experiment. The charges were ordered to be kept regular night and day. Although apparently different, I was not inattentive, and felt confident of the result. At the end of 24 hours a change was visible. At first, a dull white, then a mottled, and lastly, a No. 3 grey pig made its appearance, and this, he it remembered, from a furnace arranged and charged for white or inferior metal. There was the fact, evident, undeniable. But it was destined not to long in view. It could not be disputed, but it might be counteracted. And so it was. No sooner was the phenomenon espied by a certain official in the establishment, than an order was issued to alter the charge. This order was carried out in such a manner as to leave out all consideration of regularity or system in the feeding or working of the furnace. I myself saw the feed-board, or diary, and I was astonished at the utter recklessness which it exhibited. However, the facts sought after, were

found and confirmed, and I did not think it worth while to enter into a discussion of motives, as it would neither remedy the matter, nor benefit science."

Mr. Wall proceeds to say, that as much as 6 per cent. of iron has been found in the slag from an ordinary worked furnace—while from the process of that gentleman, an increase in the product of metal is obtained, as compared with the usual mode of smelting. The effect is stated as being more particularly noticed during some experiments made at the Milton Iron-Works. In the course of a few tapings, after the application of the battery, a difference was observed in the relative qualities of the metal and slag. The former appeared better, and the latter clearer. This circumstance was soon remarked by the furnace servers, as well as the manager, and at the end of a week, the metal product of the furnace was found to have increased, without any alteration in the charges, in the proportion of 7 to nearly 9.

We have, in our preceding remarks, confined the application to the smelting of iron, which being of paramount importance, more especially at the present moment, may be considered as more deserving notice, than the process as applied to other metals. The passing of a current of electricity, through a body of metal, while, in a state of fusion, has the effect, not only of clearing it of all evaporative substances, as sulphur, arsenic, phosphorus, &c., but effects a change in the molecular arrangement, and imparts to it a ductility and strength only otherwise attainable, after tedious and expensive processes. Copper, for instance, which is known to refuse to part with its alloys, either to the scientific efforts of ingenuity, or the power of the refining fire, except at a great loss of the metal itself, is cleared of the sulphur, arsenic, &c., in less than an hour, even when opposing a mass of 8 or 10 tons to the action of the electric battery. Nor is any loss sustained by the metal, beyond the riddance of those deteriorating substances, while it is naturally rendered more perfect. This alone may be taken as an instance, while the patented process is equally applicable to any other description of metals.

CHEMISTRY OF THE STEAM-ENGINE.—No. I.

BY T. CRADDOCK, ESQ., BIRMINGHAM.

We regret our space will not allow of giving Mr. Craddock's excellent introduction to his course of lectures. "On the great importance of possessing the mind with a clear perception of first principles, both in relation to its own facility in acquiring a correct individuality of opinion on every subject that can engage the human mind, and in enabling it to choose the good, and refuse the evil presented by other men for its reception;" we shall, however, otherwise fully avail ourselves of the lecturer's kindness, in forwarding his notes, by laying before our readers all the practical material with which they abound, commencing with—

LECTURE I.—ON THE COMBUSTION OF COAL.

Before proceeding to the combustion of coal, it may be well to explain some of the technicalities of the science, which give it a repulsive form to the minds of those who have not made this subject their study. Chemistry has made known to us, that all the variations of form, colour, and properties, are due to the almost endless combinations of a comparatively few simple substances—by simple substances, we mean those which chemistry has not been able as yet to decompose. Of these simple substances, there are 64—42 of which are metals, 8 combustible or inflammable substances, the remainder being supporters of combustion, or acidifying substances. Of the supporters of combustion we have only to do with oxygen—of the combustible bodies, carbon and hydrogen. Another of the peculiarities of chemistry is, that these bodies combine, each in their definite proportions. This brings us to the atomic theory, to which I would, for a moment, call your attention. This theory is founded upon the assumption of the subdivisions of matter into its ultimate or smallest atom. How small this may be, we have no means of knowing—as the microscope, with all its wonder-working properties, has not been able to show us the minutest subdivisions of which matter is susceptible. Having thus assumed the smallest atoms, and having, by experiment, ascertained the relative proportions, in which the various simple substances combine—the atomic theory certainly, when understood, conveys to our minds a clear and concise knowledge of the first elements of chemical science. To commence with hydrogen, the lightest body known, being not much more than half the weight of the air we breathe. This is made unity—or assuming one atom of hydrogen to be by weight one, all the others are to this, in proportion to the weights in which experiment has shown they combine with each other; so that we have one atom of oxygen, represented by being eight times the weight of one atom of hydrogen, and so on for the following substances: one atom of carbon, weight 6; one atom of nitrogen, weight 14; one atom of carburetted hydrogen, or coal gas, weight 8—this being composed of one atom of carbon, whose weight is 6, with two atoms of hydrogen, weight 2, so that its weight is seen to be that of its constituent elements. One atom of carbonic acid gas is composed of two atoms of oxygen, which, as will be remembered, was by weight 8 for each atom: these uniting with one atom of carbon, weight 6, give a resulting atom of carbonic acid gas, weight 22. Again, one atom of hydrogen, weight 1, combining with one atom of oxygen, weight 8, forms a resulting atom of steam, or water, whose weight is 9. Again, two atoms of nitrogen, the weight of each of which being 14, united with one atom of oxygen, by weight 8, give, as the weight of an atom of atmospheric air, 36. We have next to ascertain, what are the constituents of coal, from which heat is produced, before we can get a clear conception of the required conditions for its most efficient combustion, in as far as a knowledge of chemistry can aid us. On heat or fire being applied to a charge of coal in the furnace, the first thing that takes place is a distillation of its volatile products: the only one of any importance for us to notice in connection with the steam-engine, is hydrogen, with its equivalents of carbon vapour, which constitute the two principal resulting gases—carburetted hydrogen, or the common coal gas, with bicarburetted hydrogen, or olefiant gas: the former of these is produced in considerable abundance from bituminous coal; the latter may be stated at about 15 per cent. of the former, in such qualities of coal. These gases differ in their constituents, only by the latter being composed of two atoms of carbon, with two of hydrogen—while the former is composed of two atoms of hydrogen, with only one of carbon; the carburetted hydrogen separates itself, in the act of combustion, into its elements, carbon and hydrogen—the two atoms of hydrogen uniting with two atoms of oxygen, and therewith forming two atoms of steam; whilst the one atom of carbon combines with two atoms of oxygen, forming therewith one atom of carbonic acid. The combustion of the bicarburetted hydrogen, differs from the former only in its requiring two additional atoms of oxygen for the saturation of the one additional atom of carbon; nor does the resulting product differ, except that we have here formed two atoms of carbonic acid, whereas from the coal gas we had but one. Supposing now the gases to have been all dissipated, and that nothing remained of a combustible nature but the glowing carbon—we see that, for every atom of this carbon, two atoms of oxygen are required for its perfect combustion, the resulting products therefrom being carbonic acid gas. If we now take 100 lbs. of the best Newcastle coal, which is composed of 88 lbs. carbon, 54 lbs. hydrogen, 54 lbs. azote or nitrogen, and oxygen, with 14 lbs. of ashes—we should have 23 lbs. carburetted hydrogen to produce combustion of the hydrogen of which would require 42 lbs. of oxygen, producing 47 lbs. of steam, or water. We have yet to supply the saturating quantity of oxygen for 88 lbs. of carbon, which is 352 lbs.—the resulting product of which is 322 lbs. carbonic acid. The weight of atmospheric air, required to pass through the furnace, for the combustion of the above 100 lbs. of coals, is 956 lbs.—of this, 690 lbs. is nitrogen. The gases that pass up the chimney would, supposing it to pass off at a temperature of 600 deg., be in volume 31,000 cubic feet—or, supposing the above quantity of coal consumed in one hour, the volume of gases passing up the chimney would be equal to 517 cubic feet per minute.

It is here to be remarked that the nitrogen is not only a useless agent in the furnace, but positively injurious; as, whilst it does not add to the production of heat, it absorbs much of that produced by the other substances. I have made a calculation, which, without claiming for it strict accuracy, is a close approximation to the quantity of heat that would be required to raise the temperature of the 690 lbs. of nitrogen we have seen must pass through the furnace for the combustion of the aforesaid 100 lbs. coals; from which I find that, to raise its temperature from 50 deg. to 600, which is a low temperature for the gases to leave the boiler—yet, at this low temperature—it would require as much heat as would convert 86 lbs. of water into steam, which, if we take 8 lbs. of water as that which 1 lb. of coal would convert into steam, it would then require upwards of 10 lbs. of coal to give the heat, uselessly carried away by the nitrogen; here, then, would be a saving of at least 10 per cent. of fuel, could we procure the oxygen in its pure or unmixed state. There is yet one other compound formed by the combustion of coal in steam-boilers, that requires our consideration. It is carbonic oxide, which is produced by the carbonic acid gas passing through, or over, the glowing, or ignited, carbon, from whence it takes up another equivalent of carbon, and is no longer the non-combustible carbonic acid but a combustible called carbonic oxide, of double its former volume, from which to produce all the heating effect it is capable of—it must, previous to passing out of the furnace, or before its temperature is otherwise too much lowered, be supplied with another equivalent, or atom, of oxygen. This gas, from its being partially saturated, previous to its having its last or full equivalent of oxygen, takes fire at a lower temperature, and is that which is seen to burn with a bright flame at the top of the muffle or other chimneys. From what has been said, we see that the first thing that takes place, on a charge of coal being applied to the furnace, is, that in the distillation of the volatile products, a cooling effect is produced; the result of which is generally two-fold—to diminish the generation of steam, and, at the same time, to cool down the combustible gases below the temperature of ignition: but as this is anticipating our remarks on the question of smoke prevention, I shall defer further observations on this head till my next lecture.

MINING IN SOUTH STAFFORDSHIRE.—Here all is bustle and activity: all the masters have on hand double the amount of orders they are able to execute. In the neighbourhood of Tipton, Darlaston, Wednesbury, Bilston, and Great Bridge, new furnaces are in course of erection; but the want of coals is felt as in North Worcestershire; the miners are obtaining 5s. per day; but they will not work more than four days a week; and the proceedings in the police courts afford daily proof of disputes between men and masters.—*Manchester Examiner.*

DIRECT LINE OF RAILWAY FROM LONDON TO MANCHESTER.

The establishing of a direct line of railway from London to Manchester—one of the most opulent manufacturing towns of the United Kingdom, and the glory of British industry, which has rendered our cotton and print goods the first in the markets of nearly the whole world—will be one of the greatest benefits that could be bestowed on the energy of that enterprising population, by bringing them in a direct contact with the metropolis—a desideratum long been wanting. Railroads are no longer to be regarded as mere private speculations, but as great public concerns, forming a new, but most material, element in the progress and development of commerce, mining enterprise, national wealth, and national resources, of every denomination, not only in this country, but in France, Belgium, Germany, Sweden, Spain, Italy, and even in uncivilised Russia, wherever they have as yet been introduced. Their operation has already effected changes in all departments of trade, far beyond the contemplation and conception of those who originated these schemes. This is satisfactorily proved in the case of all the great railroads in the United Kingdom—as, within the last few years, their traffic and income have, in many cases, doubled, trebled, and even quadrupled, as may be seen from the reports of the London and Birmingham, and other railways. The following is the comparative mileage of passenger traffic for the half-years, from 30th of June, 1839, till 30th of June, 1845, on the London and Birmingham Railway:—Half-year, ending June 30, 1839, number of passengers 267,144, miles travelled 17,391,035; June 30, 1845, 615,904 passengers, 38,758,260 miles. Comparative statement of half-yearly receipts from all kinds of traffic, on the same line:—Half-year ending June 30, 1839, 270,241l. 4d.; June 30, 1845, 447,190l. 17s. 3d. On the Liverpool and Manchester line, from the year 1831 till 1836, the gross receipts for passengers rose from 43,600l. to 133,901l.; for merchandise, from 21,875l. to 93,184l.; for coals, 218l. to 7550l.—total, from 65,693l. to 234,635l.; profits, from 30,314l. to 85,053l.; and dividend, from 4½ to 10 per cent. Both of the above have been rapidly on the increase. Up to the opening of the Liverpool and Manchester line, railway transit was directed more particularly to local traffic, especially as regards minerals, while that under notice was undertaken with a view to the conveyance of passengers and the transit of raw cotton, manufactured goods, coals, &c. &c.; but since which period, it has been found in nearly every case, where a railroad adapted for carrying passengers has been brought into operation, that the amount of travelling between the two extremities of the line has been quadrupled. These principles being indisputable, they apply with peculiar force to the case of London and Manchester—the two largest emporiums of this commercial empire. The immense population, resources, and industrial activity, of Manchester and its neighbourhood, render the question of railway communication and its facilities one of extraordinary importance, as, within a circle of 15 or 20 miles radius round the town, a population of upwards of a million and a-half of industrious manufacturers are concentrated, who are, almost without exception, either actively engaged in, or directly dependent upon, the staple fabrication of cotton goods—as, in 1844, the importation of cotton wool amounted to no less than 646,874,816 lbs., principally consumed in this district, where, by the aid of machinery, it is spun, woven, bleached, printed, and, in an incredible short time, again exported to all parts of the globe. The necessity of a direct line between Manchester, as the chief centre of production of the most important of our manufactures, and the metropolis—the great emporium, not only of our commerce, but that of the whole world—is fully established by the general principles already stated, and confirmed by the insufficiency of the present means of transit and intercourse, to meet the increased demand without unnecessary expense. It appears there are strong complaints made by the manufacturers, both of Birmingham and Manchester, that the directors of the London and Birmingham and Manchester and Manchester lines, finding that their traffic has so rapidly increased, the company has been positively obliged to refuse the heavier descriptions of loads. This has been, and is, the case with the conveyance of the vast produce of the coal fields of the Midland Counties, which would afford an inexhaustible supply of this requisite fuel to the metropolis, and the intermediate towns, and greatly diminish its price, as well as the conveyance of live and dead stock to the London markets. The monopoly prices were kept up by the London and Birmingham Company, till the project of Remington's line was published in 1844, on which they immediately reduced their fares, as the probability of competition increased, they continued to make further reduction in 1845, and again a still further reduction at the commencement of the present year. The same statement applies to the cases of the Grand Junction, and the Manchester and Birmingham, which now constitute the grand alliance, monopolising the traffic of the most important towns of the kingdom—receiving, at this moment, an income of above 30,000l. a week. The constructing of a direct trunk line from London to Manchester, is the only means that can afford that most important manufacturing district a cheap transit for their produce to the capital, so as to put down the monopoly which now exists. One great fact, of the value of the payments required by Act of Parliament have been made, and a sum instantly raised of nearly half a million sterling, the greatest sum ever deposited by any similar company for such a purpose. This proves that the promoters are not only convinced of the expediency and necessity of such a line, but they are prepared to carry out the project with zeal; and there is very little doubt of its being carried, and render to that great manufacturing district all the benefits that railway enterprise can afford at a moderate rate of conveyance and transit of merchandise.

MAGNETO-ATMOSPHERIC RAILWAY.—Locomotion at the present time appears to be occupying the minds of nine-tenths of the community, and scarcely a week passes without some infallibly superior scheme being added to those already proposed—travelling by air, by steam, and by ropes—something new every day. Now we have a combination of the atmospheric and electro-magnetic powers—not that electro-magnetism is to be employed as a power in moving the train, but as a means of attaching it to the piston in the atmospheric tube, to obviate the necessity for an opening in the tube, and consequently to do away with that troublesome and expensive appendage, the valve. All who are in any way acquainted with the phenomena of electro-magnetism will remember, that a bar of ordinary soft malleable iron, bent into the form of a horse shoe, and covered with insulated copper wire bound round it, may be instantly converted into a powerful magnet by passing through the copper wire a stream of galvanic electricity. The current passes at right angles to the axis of the bar of iron, and it becomes a magnet by induction. A magnet of this kind is powerful in comparison to its size and the intensity of the galvanic current passing through the wires; and such a one is capable of exerting the influence at a considerable distance. In the Magneto-Atmospheric Railway such a magnet as this is employed, and the first carriage of the train, or that which would ordinarily be fastened to the piston, will be devoted to the necessary apparatus. Fixed to this carriage will be several large bent iron bars, capable of being converted into magnets of an attractive power of many tons. These bars prepared with the coating of copper wire, will descend to within a very short distance of the upper part of the tube, in which, in the place of the valve, a thin sheet of copper will be placed. This will be continuous along the line, bolted down on either side, and perfectly impervious to the external air. The iron bars fastened to the carriage may in a moment be rendered magnetic by making a connexion between the copper wires which surround them, and strong galvanic batteries ready in the carriage; the moment the connection is complete the bars become magnets, and will attract iron brought into proximity to them; the piston in the tube is furnished with bars of iron, which ascend and almost touch the under surface of the thin copper in place of the valve, and the magnets above and the iron bars on the pistons below are separated only by a distance of perhaps three-fourths of an inch. When the carriages are ready for starting the bent bars above are rendered magnetic, and powerfully attract the bars upon the piston in the tube; the piston is set in motion by the atmospheric pressure against a vacuum, and when it moves its strong attraction for the magnets in the carriages, causes the train to move along the railway. A magnet of this invention will, we understand, be soon submitted to the public.

IMPROVEMENT IN RAILWAY CLOCKS.—We understand, Mr. Fairclough, of Tottenham, has brought out an improved clock for use at railway stations and adjacent taverns. If it accomplishes what is said of it—viz., to show at once the London or railway time, and the local time, or time at the several stations or towns—it will be found a very valuable improvement, and in great request, as it is said a clock of this kind will cost little more than the ordinary one. Of course these clocks are more especially intended for such railways, that run in any degree, east or west. The idea and peculiar manner of accomplishing the desideratum, we believe, originated with Mr. J. Tiltrow, C.E., of Bloomsbury-square.

